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DISEASES CAUSED BY BACTERIA AND FUNGI.

I. CHAPMAN, G. H., & RAWLS, W. B. (1936). **Studies of Streptococci. I. Qualitative Differences in Resistance to Various Agents.**—*J. Bact.* **31.** 323-331.

II. CHAPMAN, G. H., & CURCIO, Lillian. (1936). **Studies of Streptococci. II. Quantitative Differences in Resistance to Sodium Bicarbonate and Hexylresorcinol.**—*Ibid.* 333-337.

III. CHAPMAN, G. H., BERENS, C., & NILSON, Edith L. (1936). **Studies of Streptococci. III. Preliminary Attempts to correlate Resistance to Chemicals, etc., with Pathogenic Effects.**—*Ibid.* 339-346.

[Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 716-717. Signed C. C. OKELL].

I. Smooth strains of streptococci, haemolytic and non-haemolytic, were isolated from suspected foci in patients suffering from such chronic diseases as arthritis, respiratory tract infection, colitis, etc. The strains were found to vary in their resistance to the bactericidal action of diluted, fresh, defibrinated guineapig blood. Resistance to this bactericidal reagent was found to be correlated with resistance to various chemical agents such as sodium carbonate, sodium bicarbonate, hexylresorcinol, phenol, basic fuchsin, " merthiolate ", etc., as judged by the time/dilution factor necessary for the killing of the strains. 1,868 strains were tested by exposing them to 1 : 200,000 hexylresorcinol and 0·3 per cent. sodium bicarbonate respectively for 1 hour and comparing the reduction of viable organisms by means of blood agar transplants. Similar results were obtained with the two solutions in 99·2 per cent. of strains. These results suggest that streptococci have varying degrees of non-specific resistance which show both in bactericidal biological tests and also run parallel in tests against various disinfectants.

II. The 1,868 strains were tested by exposing each strain to 0·3 per cent. sodium bicarbonate for 1 hour and 0·5 per cent. of bicarbonate for 2 hours and then testing for viability both immediately after mixing and also after exposure. Each strain was also tested by exposing it to 1 : 200,000 hexylresorcinol for 1 hour and 1 : 125,000 hexylresorcinol for 2 hours and testing for viability immediately after mixing and again after exposure. The results showed that in 83·2 per cent. of the 1,868 strains the results were exactly the same with the two chemicals. These observations confirm the view that certain smooth strains of streptococci have a non-specific factor of resistance to chemical agents and suggest that this non-specific resistance can be measured by the method described (details in the text).

III. The intravenous injection of 5 c.c. of live cultures of smooth streptococci which were resistant to " bactericidin " killed 14 out of 16 rabbits (87·5 per cent.). Four rabbits injected with 5 c.c. of cultures which were not resistant to " bactericidin " survived. Suspensions (killed with " merthiolate ") of smooth strains of streptococci which had proved resistant when exposed for 1 hour to 0·3 per cent. sodium bicarbonate and to 1 : 200,000 hexylresorcinol were injected intravenously into 17 rabbits in amounts containing 10 mgm. of N. Within three days 82·4 per cent. of the rabbits died. On the other hand the same amount of suspension from strains which were relatively sensitive to bicarbonate and hexylresorcinol failed to kill rabbits with one exception. So far as these results go they suggest that there is a correlation between (1) resistance to the bactericidal action of fresh defibrinated guineapig blood ; (2) resistance to sodium bicarbonate, hexylresorcinol, etc. ; (3) the lethal effect of live cultures in rabbits and (4) the lethal effect of killed cultures.

I. Ramon, G., Richou, R., & Djourichitch, M. (1936). Sur l'influence des conditions de vie dans l'acquisition de l'immunité antistaphylococcique naturelle chez le cobaye. [**The Influence of Environment on Natural Antistaphylococcal Immunity in the Guinea Pig**].—*C. R. Soc. Biol. Paris.* **121.** 1559-1561. 1 table. [2 refs.]

II. Madison, R. R., & Dart, E. E. (1936). **Veterinary Staphylo-Fibrinolysin.** —*Proc. Soc. exp. Biol., N.Y.* **34.** 299-300. 1 table. [2 refs.]

I. The authors show that the sera of guinea pigs kept in strict isolation almost invariably contain less than 0·1 unit of staphylococcal antitoxin, whereas guinea pigs housed with horses show a fairly high degree of acquired immunity against staphylococcal toxins.

They found that a high degree of immunity was developed in the non-immune guinea pigs within six weeks by mixing them with the immune group in large cement pens.

They hope to be able to explain the mechanism of this natural development of immunity in guinea pigs in a later article.

II. The authors tested strains of staphylococci for their capacity to liquefy human fibrin. Of 132 strains isolated from internal human disease lesions 80 per cent. had this property, whereas about 90 per cent. of strains derived from external human lesions, and all strains of animal origin, were non-lytic by the same *in vitro* technique.

A table of the authors' findings tends to show the possibility of there being at least five different fibrinolytic factors formed by pathogenic staphylococci. Each factor appears to be specific for the fibrin of one animal species. Mention is made of two monovalent lytic horse strains which were originally isolated from " abscesses " in horses. [? abscesses resulting from inoculation with strains of staphylococci not of equine origin, as these two strains appear contrary in their lytic property to the authors' findings regarding 77 other strains of animal origin].—C. V. Watkins.

Ramon, G., Richou, R., & Djourichitch, M. (1936). Sur l'immunité antistaphylococcique naturelle chez le lapin et chez le cobaye. Etude expérimentale. [**An Experimental Study of Natural Antistaphylococcus Immunity in the Rabbit and Guinea Pig**].—*Rev. Immunol.* **2.** 375-387. 7 tables. [13 refs.]

By observations on several groups of guinea pigs and rabbits living under different conditions, particularly with regard to contact with other animals, and by a series of experiments in which guinea pigs were infected with staphylococci

by means approximate to those of natural circumstances, it was possible to determine that natural antistaphylococcal immunity in these animals depends upon a previous natural infection, and is not a natural non-specific immunity common to all animals of these species.—J. E.

I. PILOT, I., BUCK, C., & DAVIS, D. J. (1936). **Hemolytic Streptococci from Tonsils of Cows, Hogs and Sheep.**—*Proc. Soc. exp. Biol., N.Y.* **34.** 233-235. [4 refs.]

II. SMITH, F. R., HANKINSON, C. L., & MUDGE, C. S. (1936). **Fibrinolytic Activity of Beta Hemolytic Streptococci from Cow's Milk.**—*Ibid.* 266-270. 1 table. [8 refs.]

III. EVANS, Alice C. (1936). **Studies on Hemolytic Streptococci. I. Methods of Classification.**—*J. Bact.* **31.** 423-437. [Numerous refs.]

I. Haemolytic streptococci were found to constitute part of the normal flora of the tonsillar crypts of cow, pig and sheep in a high percentage of cases. All conformed to the animal type; none were identical with *Str. epidemicus.*

II. Of 23 strains of haemolytic streptococci isolated from cows' milk, nine showed varying degrees of fibrinolysis of bovine plasma. The authors think that fibrinolysis may be correlated with pathogenicity. [The other characters of the 23 strains were not determined].

III. This paper is the first of a series in which the author proposes to study a representative collection of haemolytic streptococci, and to co-ordinate the work of the many investigators on this subject into a rational classification. After discussing the value of the various tests used for classification of streptococci, Evans outlines the methods adopted in her investigation. Her main enquiry concerns the differential value of the sensitivity of streptococci to four phages, and she states that the groupings made by this method agree with species already differentiated on other bases.—N. J. SCORGIE.

I. WOLLMAN, E., & BARDACH, M. (1936). Influence du fractionnement des doses sur la tolérance du cobaye vis-à-vis de l'infection charbonneuse. [**Influence of the Fractional Division of the Doses upon Tolerance of the Guinea Pig to Anthrax**].—*C. R. Soc. Biol. Paris.* **121.** 1278-1280. [2 refs.]

II. HRUSKA, C. (1936). La dissociation du vaccin charbonneux de Pasteur. [**Dissociation of Pasteur Anthrax Vaccine**].—*Ibid.* 1314-1316. [1 ref.]

I. The authors, working with the second anthrax vaccine of Pasteur, found that approximately two subcutaneous M.L.D. could be tolerated by guinea pigs if the dose was divided into four parts and injected at widely separated sites. No immunity was thereby conferred. If the guinea pigs died, no macroscopic lesions could be determined at the sites of inoculation, but cultures of the bacteria were obtained from several of them. Practically no increase in tolerance by the guinea pigs resulted from a fractional division of the doses if the injections were made intradermally.

II. The author shows that subcultivation of the first anthrax vaccine of Pasteur on agar slopes renders it lethal for guinea pigs and rabbits as well as for mice, while its passage through guinea pigs and rabbits fixes a type only lethal for mice. The subcultivation on agar causes dissociation into granular colonies which resemble those of cocci and appear to be very virulent.

He suggests that field use of the first vaccine may prove fatal if it contains the dissociation forms and is virulent for guinea pigs and, in part, for rabbits and also that, if no dissociation forms are present in the first vaccine, fatal results may then follow the use of the second vaccine.—C. V. WATKINS.

KANAUKA, K. (1935). Tuberkulez rogatogo skota i meri borbi s nim v Litve. **[Control of Bovine Tuberculosis in Lithuania].**—*Balti Riikide II VetPäevluse Ref.* pp. 40-51. 3 tables.

In 1930 a law for the control of bovine tuberculosis in Lithuania was passed and the State Veterinary Bacteriological Institute, Kaunas, was placed in charge of the work. A combination of Ostertag's and Bang's systems was adopted, in accordance with which tuberculin tests as well as bacteriological tests of excretions, and compulsory slaughter with compensation, were employed. The scheme has not yet been applied to the whole country, but is being extended as facilities allow.

In 1934, 699 farms with close on 15,000 head of cattle were inspected and only 1,915 cattle (12·8 per cent.) reacted to tuberculin, whilst in 1932, 624 (18 per cent.), of 3,478 cattle tested, reacted.

In farms "kept continuously under observation" between 1932 and 1934, with a strength of some 2,300 cattle, the percentage of reaction fell from 26·3 to 22·6 during the three years.

The percentage of cattle found tuberculous at meat inspection was very low (2 per cent. or less) with the same figure for pigs.

In a discussion on the paper, ALEKSA said that BCG did not give very good results in calves and that indigenous breeds of cattle in Lithuania were, if anything, more susceptible than improved stock. LAJA advocated a voluntary eradication scheme in Estonia and reported poor results with BCG. MEZAKS advocated the American eradication method, which has already been used in Estonia. He reported good results with BCG in one herd. Other speakers gave varied opinions on it.

It was resolved by the delegates that the intradermal test should be recommended for use in the Baltic States, and several other resolutions for the control of tuberculosis in cattle and its spread to mankind were also passed. Special national compensation funds are necessary and more research on BCG is desirable.

—J. E.

SMYTHE, A. R., OYLER, Madeline, ORR, A. B., & STABLEFORTH, A. W. (1936). **Tuberculosis in the Dog.**—*Vet. Rec.* **48.** 779-791. [1 ref.]

The clinical, pathological and bacteriological aspects of tuberculosis in the dog were considered as a basis for a discussion. Smythe, dealing with the clinical aspect, drew attention to thoracic, abdominal and localized forms. The wasting of the tissues lying between the zygomatic processes and the occipital crest was considered by him to be a symptom of serious import frequently helping towards a definite diagnosis. The ophthalmic and skin tuberculin tests are not of value in the dog, but the subcutaneous test is stated to give a high percentage of correct results.

Oyler dealt with the experience gained during the past three years at the Beaumont Animals' Hospital, where 23 cases of tuberculosis in the dog have been met with; this was 0·15 per cent. of the dogs examined. Animals most affected were between two and seven years of age, while acute and sub-acute cases were more common than chronic. More reliance was placed on the demonstration of acid-fast bacilli in fluid removed from the chest or abdomen by paracentesis than on the use of tuberculin.

The pathological aspect was dealt with by Orr who pointed out that lymphosarcoma affecting the ileo-caecal gland, and sometimes carcinoma of the liver, may be mistaken for tuberculosis; he emphasized that the demonstration of the tubercle bacillus is essential for diagnosis, even at *post-mortem* examination.

Stableforth described the types of tubercle bacilli and showed that the dog can be infected with either the human or the bovine type and that the type with

which an individual dog is affected is largely dependent upon the source of infection to which it is exposed. The discussion was continued largely along the lines of the pathogenesis of tuberculosis of dogs.—R. LOVELL.

I. CORPER, H. J., DAMEROW, A. P., COHN, M. L., & VIDAL, C. B. (1936). **Vaccination against Tuberculosis – a Comparative Study in Man and Animals.**—*J. infect. Dis.* **58.** 158-164. 1 fig. [18 refs.]

II. NEIMAN, I. S., & WOOLPERT, O. C. (1936). **Intracerebral Inoculation of Fetal Guinea Pigs with Bacille Calmette-Guérin and the H_{37} Strain of Tubercle Bacillus.**—*Amer. J. Path.* **12.** 153-164. 6 figs. on 1 plate, 1 table. [11 refs.]

III. CLAWSON, B. J. (1935). **Experiments relative to Vaccination against Tuberculosis with the Calmette-Guérin Bacillus (BCG).**—*Arch. Path.* **20.** 343-368. 19 tables. [Numerous refs.]

I. This paper points out the similarity of the reactions which occur in man and animals following intradermal injections of avirulent tubercle bacilli. It also shows that injections of avirulent tubercle bacilli produce lesions similar to those produced by the same non-viable organisms. Avirulent human or bovine (BCG) tubercle bacilli injected intracutaneously do not produce progressive lesions in man, and when injected in amounts capable of causing " tubercle" without ulceration (0·01 mg.) appear to lose their viability in these lesions within about six months.

II. In this paper the authors compare the relative pathogenicity of graded doses of BCG with virulent tubercle bacilli (H37) as determined by the intracerebral inoculation of foetal guinea pigs. It is claimed that in foetal tissues the disease process in both cases is much the same and differs only in degree. It is more marked in the case of H37, which strain also spreads more quickly from the site of inoculation. The authors have failed to transfer BCG from one foetus to another and in only four instances out of 24 was it possible to cultivate BCG on artificial media from inoculated foetuses.

III. Experiments were performed to determine the safest method of administering BCG vaccine. The methods compared were the subcutaneous and intravenous injections of living or killed organisms.

" In general it can be said, as far as safety in the process of vaccination with B C G is concerned, that all methods are safe except the one in which the living organisms are injected intravenously. Even by this method progressive tuberculosis does not occur, but too many non-progressive tubercles develop in the lungs, liver and spleen after the administration of the vaccine to permit one to consider it a safe method. The observations in the experiments did not justify the injection of living B C G vaccine intravenously."

The author's experiments also show that there is no relation between allergy and the presence of antibodies. A high antibody content could be stimulated without allergy and *vice versa*. It was found that allergy could not be demonstrated in animals in which lesions could not be found.—GWILYM O. DAVIES.

BOQUET, A. (1936). L'allergie et l'immunité dans la tuberculose. [**Allergy and Immunity in Tuberculosis**].—*Rev. Immunol.* **2.** 150-164.

This paper is an excellent review of the nature of allergic reactions and the principles underlying immunity to tuberculosis. It does not lend itself to abstraction. The experimental data which form the basis of the arguments have been published in previous articles.—R. E. GLOVER.

MARCZYNSKI, J. (1936). Obraz krwi swinek morskich, szczepionych wyciagiem acetonowym bakteryj gruzliczych. [**Blood Picture of Guinea Pigs Inoculated with Acetone Extract of Tubercle Bacilli**].—*Przegl. wet.* **49.** 137-162. 2 graphs. [Numerous refs.] [French summary : abst. from orig.]

The author discusses the chemical question in relation to the tubercle bacillus dealing also with the filtrable stage. He gives an account of his experiments on guinea pigs. He counted their blood corpuscles with a Mitz apparatus and injected into them subcutaneously acetone extracts of the bacillus. He determined the haemoglobin content of their blood with Helli's haemometer and made a microscopic study of the blood. There was a reduction in the erythrocyte count and haemoglobin content and a leucocytosis. The lymphocytes were at first low in number and increased later. The blood picture returned to normal after several days.

I. SCHAEFER, W. (1936). La fréquence des deux types du bacille de la tuberculose aviaire dans l'infection naturelle des oiseaux et chez les cobayes d'expérience. [**The Frequency of the Two Types of Avian Tubercle Bacillus in Natural Infection in Birds and in Guinea Pigs**].—*C. R. Soc. Biol. Paris.* **121.** 815-816.

II. SCHAEFER, W. (1936). Application du séro-diagnostic des types du bacille de la tuberculose aviaire au contrôle de la pureté de ces germes. [**Differentiation of Types of Avian Tuberculosis Infection by Serological Tests**].—*Ibid.* 1290-1292. [1 ref.]

I. The author examined several avian strains of tubercle bacilli obtained from natural infection in birds and guinea pigs, to determine the relative frequency of the two antigenic types, and whether any other types could be determined by complement-fixation tests. Of 25 avian strains thus examined, 12 were of Type " I " and 13 of Type " II ". In the case of 18 guinea pig strains, 8 were of Type " I " and 10 of Type " II ". No cases due to other serological types of avian tubercle bacilli were determined.

II. The author shows by complement-fixation tests that an antiserum prepared from a strain of *Mycobact. tuberculosis* (strain " Bat "), which he has recently isolated from guinea pigs, contains antibodies against Types " I " and " II " avian strains which he has previously described.

He refers to the work of KAHN and SCHWARZKOPF in which only about 1 per cent. of single-cell cultures of " S " types of avian tubercle bacilli developed, while cultures of groups of about five bacilli were successful in 75 per cent. of cases.

He concludes that, either his guinea pig strain contains two types of bacilli equivalent to the two avian types, or that contamination of his culture may have occurred following repeated sub-cultivation.—C. V. WATKINS.

I. HIROKI, H. (1935). Untersuchungen über den Tuberkelbazillus des Typus gallinaceus. I. Mitteilung: die Verbreitung der Hühnertuberkulose zu Mukden, Manchoukuo. [**Research on the Avian Type of Tubercle Bacillus**].—*J. orient. Med.* **23.** [In Japanese: abst. from German abst. p. 49 of summaries in western languages].

II. HIROKI, H. (1935). Ueber die aus menschlichen und tierischen tuberkulösen Untersuchungs-materialen erhaltenen säurefesten Saprophyten. [**Acid-Fast Saprophytic Bacteria in Human and Animal Tissues**].—*Ibid.* [In Japanese: abst. from German abst. p. 54 of summaries in western languages].

I. In an examination of a large series of fowls in Mukden, 17 per cent. were found to be suffering from avian tuberculosis. The pathological anatomy of the disease is noted. The differentiation of avian from other types of acid-fast bacilli is discussed. When mice are infected artificially with avian tubercle bacilli, there is rapid multiplication of the organism in the lungs.

II. A study of the non-pathogenic acid-fast bacilli isolated from dust, etc., and also isolated as incidental contaminants of *post-mortem* specimens.—E. J. P.

—. (1935). **The Incidence of Bovine Type of Tubercle Bacillus in Pulmonary Tuberculosis.**—*Rep. med. Offr Hlth Aberdeen, 1934.* pp. 10-11.

Examination of sputum from 100 cases of pulmonary tuberculosis from the county area showed 14 to be due to the bovine type of tubercle bacillus ; in the city area, to date, six infections with the bovine type have been found in 65 cases. The clinical history of these cases suggests direct infection through raw milk and not by human transmission. It is difficult to explain why the incidence of infection with the bovine type is apparently greater in this area than in England ; the incidence of tubercle bacilli in milk and the amount of raw milk consumed per head is not greater than in other parts of the country.—J. C. WALLACE.

LOBEL, L. W. M. (1936). Büffellepra (lepra bubalorum). [**Lepra bubalorum**]. —*Hand. ned.-ind. natuurw. Congr.* p. 385. [1 ref.]

The author states that lepra bubalorum is confined to the Dutch East Indies and that 63 cases have been observed [for a description of the condition see this *Bull.* **5.** 402].—J. E.

TROSSARELLI, L. (1935). Sulla ricerca dei germi acido-resistenti paratubercolari. [**Saprophytic Acid-Fast Bacilli**].—*G. Batt. Immun.* **14.** 1407-1434. [English, French and German summaries : abst. from orig.]

The author reviews the present knowledge concerning saprophytic acid-fast bacteria and classifies them into four main groups :– those found in cold-blooded animals, in butter, on grasses and other vegetable matter, and in normal and pathological secretions and excretions of animals or man. He concludes that in Italy saprophytic acid-fast bacteria are not so common as has been generally supposed.—J. A. NICHOLSON.

BEAUDETTE, F. R., & HUDSON, C. B. (1936). **An Outbreak of Acute Swine Erysipelas Infection in Turkeys.**—*J. Amer. vet. med. Ass.* **88.** 475-488. 1 table. [12 refs.]

The author records the occurrence of an acute infectious disease in turkeys in which 200 birds died out of a flock of 500 in a period of nine days. *Post-mortem* examinations were carried out on 24 birds and cultures taken from 23 yielded the same organism in each case. The morphological, cultural and biochemical features of this organism showed it to be identical with the organism of swine erysipelas (*Erysipelothrix rhusiopathiae*). It was pathogenic for mice and chickens on subcutaneous inoculation and pigeons were infected by intranasal inoculation but not *per os*. There were no agglutinins in the serum of 20 recovered turkeys tested, and the organism could not be recovered from the nasal cavity of the same birds.

The history of the outbreak, the lesions found at autopsy, and the cultural, morphological and biochemical properties of the organism are fully described. —R. F. GORDON.

I. SCHINDLER, W., & TEICHMANN, M. (1935). Zur Kenntnis der Schweinerotlaufsepsis beim Menschen. [*Erysipelothrix rhusiopathiae* **Infection in Man**]. —*Wien. Arch. inn. Med.* **27.** 461-478. 3 figs. [Numerous refs.]

II. ANGLEITNER, F. (1936). Unfälle anlässlich der Rotlaufschutzimpfung. Petechialfieber oder Schweinepest. [**Accidents following Immunization against Swine Erysipelas.**]—*Wien. tierärztl. Mschr.* **23.** 289-299.

III. SCHOENING, H. W., & CREECH, G. T. (1936). **Swine Erysipelas – with**

Particular Reference to Serological Diagnosis.—*J. Amer. vet. med. Ass.* **88.** 310-316. [9 refs.]

I. Description of a case of *E. rhusiopathiae* infection (bacillus of swine erysipelas) in a human being.

II. This condition was diagnosed as swine fever and it is suggested that the vaccination may have stimulated a chronic and hitherto unsuspected swine fever infection into activity (resulting in a condition simulating petechial fever).

III. Either the slow or the rapid agglutination test may be applied to the diagnosis of swine erysipelas, provided antigen is prepared from a smooth strain of organism. The interpretation of low agglutination titres depends upon the history of the individual and of the herd. Retests of such cases may be necessary. The test is, of course, inapplicable to pigs which have been immunized actively or passively against the disease.—E. J. PULLINGER.

VAN SACEGHEM, R. (1936). La pasteurellose bovine au Ruanda-Urundi. [**Pasteurella Infection in Cattle in Ruanda-Urundi**].—*Ann. Soc. belge Méd. trop.* **16.** 125-128.

A brief description is given of pasteurella infection in bovines. Of 75 cattle 66 died, the lesions being mostly confined to the thorax. Inoculation of 1 c.c. of pleural exudate into a bull killed it in five days ; the findings were those of typical haemorrhagica septicaemia. The strain of pasteurella isolated cannot be fitted into either of the three groups of JONES [(1921). *J. exp. Med.* **34.** 561]. It appears, however, to be pathogenic for certain small laboratory animals, but its biochemical reactions are not those commonly met with.—R. LOVELL.

I. BOQUET, P. (1936). Sur la mobilité du coccobacille de la pseudotuberculose des rongeurs cultivé à 18° – 20°. [**The Motility of** *Pasteurella pseudotuberculosis* **when Cultivated at 18° to 20°C.**]—*C. R. Soc. Biol. Paris.* **121.** 931-932. [2 refs.]

II. BOQUET, P. (1936). Sur la vaccination du cobaye contre la pseudotuberculose des rongeurs par des cocco-bacilles de virulence atténuée. [**Vaccination of the Guinea Pig against Pseudotuberculosis of Rodents**].—*Ibid.* **122.** 21-24.

I. The author found that 12 strains of *Past. pseudotuberculosis* all showed classical characteristics when cultivated at 37°C., but that in Martin's broth at 20°C. there was a uniform turbidity of the medium, although no motility was demonstrable. In 10 per cent. serum broth slight motility was produced at 20°C., though not at 37°C., by the more recently isolated strains, while no change was found with older strains. The substitution of glucose for glycerin in Sauton's medium induces motility, which is later inhibited by increasing acidity of the medium. pH 7 to pH 7·3 was optimum for motility. Strains rendered motile by these means lose this property within eight to 24 hours following intraperitoneal inoculation of guinea pigs.

II. The author found that an old strain of plague bacillus, isolated from a Mangabey monkey and cultivated artificially for a number of years, had lost its virulence for guinea pigs, but was capable of protecting them against a virulent strain of *Past. pseudotuberculosis.* Only local lesions followed both subcutaneous and intradermal inoculation of the test dose, while death in from one to two weeks with the formation of typical visceral lesions occurred in the control guinea pigs. Boquet shows that the immunity produced is similar to, though more rapid and complete than, that described in connexion with superimposed infections in tuberculous guinea pigs.—C. V. WATKINS.

ROZET, E. L. (1936). K voprosu o toksinoobrazovani u B. suipestifer. [**Toxin Production by** *Salmonella cholerae-suis*].—*Sovyet. Vet.* No. 1. pp. 57-62. 1 table.

The author tested 20 strains of *S. cholerae-suis* for toxin production. The following conclusions were reached :– (1) all the strains of *S. cholerae-suis* were pathogenic when fed to experimental animals ; (2) most strains formed endotoxins, which acted upon experimental animals chiefly when introduced into the stomach ; (3) only a few strains formed exotoxins, which are resistant to 75°C. for ten minutes ; (4) the exotoxins were destroyed when exposed to 80° – 100°C., and (5) *S. cholerae-suis* is an active agent in meat poisoning. A table embodies the author's results.

HART, L., & HUNGERFORD, T. G. (1936). **Septicaemic Pullorum Disease in a Flock of Adult Fowls.**—*Aust. vet. J.* **12.** 17-20. [6 refs.]

This paper describes the second Australian outbreak of septicaemic infection of adult fowls with *Salmonella pullorum*, the symptoms and lesions resembling those recently reported in Western Australia by BENNETTS [this *Bull.* **6.** 739].

The outbreak apparently originated from some pullets which had suffered from *S. pullorum* infection as chickens and it spread among 600 adult fowls, of which about 25 per cent. showed symptoms and 8 per cent. died. The symptoms were extreme depression and weakness, usually accompanied by foetid diarrhoea. The most outstanding lesions found *post mortem* were gross enlargement of the liver with miliary, small necrotic areas. All cases also showed pronounced pericarditis and myocarditis with miliary abscesses in the myocardium. A bacterium was isolated which behaved culturally as *S. pullorum*, especially in failing to ferment maltose and dulcite.—W. I. B. BEVERIDGE.

ROBERTS, E., & CARD, L. E. (1935). **Inheritance of Resistance to Bacterial Infection in Animals. A Genetic Study of Pullorum Disease.**—*Bull. Ill. agric. Exp. Sta.* No. 419. pp. 467-493. 2 figs., 16 tables. [Numerous refs.]

More than 29,000 fowls of various breeds were used in this investigation which extended over a period of ten years, and the results clearly indicate that heredity is an important factor in resistance and susceptibility to infection with *Salmonella pullorum*. Selection was effective in producing strains of fowls more resistant to infection with *S. pullorum* than were unselected stock, and the selected strains were consistent in maintaining resistance through successive generations. The F_1 generation produced by crossing resistant to susceptible stock was as resistant as the resistant parents, and the progeny of the F_1 individuals mated to resistant individuals were more resistant than the progeny of the back-cross to susceptible mates.

The results tend to show that resistance is dominant to susceptibility. The progeny of a susceptible male mated to susceptible females was much less resistant than was the progeny of the same male mated to resistant females, but no significant difference was found between the progeny of susceptible and resistant females mated to the same resistant male.

The resistance to infection with *S. pullorum* present in the experimental birds was not due to an acquired immunity, and the progeny of infected hens showed no greater resistance to disease than the progeny of non-infected hens.

In an examination of the blood of uninoculated young chicks the number of erythrocytes was found to be greater in the resistant than in the susceptible strains. The number of leucocytes was greater in the susceptible strains, while the percentage of neutrophiles was lower in the resistant chicks. In inoculated chicks the percentage of neutrophiles was much higher among the susceptibles at 6, 7 and 9 days, than among the inoculated resistants of the same age.

Records were kept of the growth of inoculated and uninoculated chicks to the age of 163 days; inoculation with *S. pullorum* has a very definite effect in retarding the growth of individuals that survive infection.—R. F. GORDON.

I. BARTEL, H. (1936). Ueber die Bedeutung der Salmonella-O-Seren für die bakteriologische Fleischuntersuchung. [**Importance of Salmonella-O-Serum in Bacteriological Meat Inspection**].—*Z. Fleisch- u. Milchhyg.* **46.** 294-299. 2 tables. [10 refs.]

II. KRISTENSEN, M., & BOJLÉN, K. (1936). Diagnostische Untersuchungen über die Salmonellagruppe. [**Diagnostic Research on the Salmonella Group**].—*Zlb. Bakt. I. (Orig.).* **136.** 294-319. 7 tables. [Numerous refs.]

III. KRÜGER, H. (1936). Die Typendiagnose bei der bakteriologischen Fleischuntersuchung. (II. Mitteilung). [**Typing of Paratyphoid Food Poisoning Bacteria. II**].—*Berl. tierärztl. Wschr.* **52.** 166-169. [For abst. of previous article see this *Bull.* **6.** 453].

IV. KAUFFMANN, F. (1935). Weitere Erfahrungen mit dem Kombinierten Anreicherungsverfahren für Salmonellabacillen. [**Enrichment Methods for Salmonella Bacteria**].—*Z. Hyg. InfektKr.* **117.** 26-32. 2 tables. [8 refs.]

V. KLIMMECK. (1936). Planmässige Bekämpfung der Enteritis in den Rindviehbeständen. [**Control of** *S. enteritidis* **Infection in Cattle**].—*Berl. tierärztl. Wschr.* **52.** 146-149 and 281. 1 table.

I. The author re-emphasizes the part played by the somatic antigen in the identification of members of the genus *Salmonella*. Much of the article is repetition of the fundamentals of antigenic analysis. What is intended to be stressed, however, is the fact that a primary salmonella identification can be effected by the use of five " key " " O " antisera. Members of the genus falling into group A have somatic factors I and II or I and III, group B factors IV or IV and V, group C factors VI and VII or VII and VIII, group D factor IX, and group E factors X and III. Practically all known members of the genus fall into one of these five groups and, since with the exception of A and E there is no common antigen, the primary classification into one of these groups is simple. With regard to A and E, these groups have but few members which are readily differentiated by their flagellar antigens. Once an organism has been fitted into its correct group, subsequent typing depends upon the identification of the various " H " antigen components. In certain isolated cases [*e.g.* differentiating *S. gallinarum* from *S. pullorum*], resort has ultimately to be made to biochemical reactions.

II. The authors record the serologic examination of 693 strains of *Salmonella* as well as 44 strains of organisms showing some relation to this genus. Using modern serologic methods, all the salmonella were readily classified under the Kauffmann-White scheme. Of the 44 other strains, 12 were agglutinated by " O " antibodies VI and VII: otherwise there was little serologic relationship. No difficulty was experienced in excluding these organisms from the *Salmonella* genus on serologic and biochemical grounds.

The remainder of the publication is devoted to a biochemical study of the strains. Thus it is shown that the 47 strains of *S. paratyphi* B could be divided into seven biochemical groupings whilst 32 of the strains fell into a single group. Similarly, 253 strains of *S. typhi-murium* fell into eight groupings though only four of the groups were of reasonable size. Grouping in other species is recorded. [Variations in biochemical activity within the species sometimes yield valuable information regarding the spread of an epidemic, as a particular strain can be identified and its spread traced].

III. A further survey of identification with special reference to antigenic

analysis. The significance of the " Vi " antigen is discussed briefly [see also this *Bull.* **6.** 751].

IV. Details of a selective medium for the isolation of *Salmonella*. The basis is tetrathionate broth made by adding to meat broth 5 per cent. of calcium carbonate, 10 per cent. of sodium thiosulphate solution ($Na_2S_2O_3$ 50 g. + distilled water 100 c.c.) and 2 per cent. of iodine solution (I 20 g. + KI 25 g. + distilled water 100 c.c.). [The percentages are close approximations]. To this basic tetrathionate broth is added 5 per cent. of sterile ox bile and 1 part per 100,000 of brilliant green. This selective medium increased the number of successful isolations of *Salmonella*, by as much as several hundred per cent., in certain cases.

V. An analysis of herds of cattle infected with *S. typhi-murium* or *S. enteritidis*. Thirty-six herds of varied sizes are included in the record. 159 out of 1,584 adults and 4 out of 147 calves gave positive agglutination reactions, whilst 47 adults and 39 calves were proved to be excreting infection. Calves usually excreted *S. typhi-murium*, but amongst adults the two infections were equally distributed. [From the text it is not clear whether a careful antigenic identification was carried out or whether the two specific names are used in the rather comprehensive manner frequently encountered in German literature. In Great Britain the common infection of calves seems to be with the Dublin variety]. Only 13 out of the 47 adults and 2 out of the 39 calves which were proved to be active excretors gave positive agglutinin reactions. [Attention of readers who refer to the original article is drawn to a note of *errata* published in the *Berl. tierärztl. Wschr.* **52.** 281].

—E. J. PULLINGER.

I. —. (1936). Sachsen. Verordnung des Ministers des Innern über die Bekämpfung des ansteckenden Verkalbens. Vom 16. April 1936. [**Saxony. Order on** *Brucella abortus* **Infection, 16th April, 1936**].—*Reichsgesundheitsblatt.* **11.** 476-477. [5 refs.]

II. KARSTEN. (1936). Ueber stummer Banginfektion des Rindes. [**Inapparent** *Br. abortus* **Infection in Cattle**].—*Dtsch. tierärztl. Wschr.* **44.** 187-189.

I. Regulations regarding the state control of *Br. abortus* infection. The article is unsuitable for abstraction, but the following points are of interest. The use of live vaccine is forbidden. Doubtful reactors to the agglutination test can only be declared to be clean if they give a clear-cut negative reaction at least three weeks after the doubtful test. Attendants who handle infected animals should not enter byres containing clean stock.

II. Attention is drawn to the fact that cases are on record in which *Br. abortus* has been isolated from the placentas of cows which gave negative agglutination reactions. Such cases seriously interfere with control measures.—E. J. PULLINGER.

I. ROOTS, E. (1935). Die Brucellose und ihre Bekämpfung. [**Control of Brucella Infection**].—*Balti Riikide II VetPäevluse Ref.* pp. 12-39. [In German].

II. ROLLE, M. (1935). Zur Frage de Brucellose. [**Brucella Infection**].—*Balti Riikide II VetPäevluse Protokoll.* pp. 42-43. [In German].

III. ALEKSA, K. (1935). Brucelloz. [**Brucella Infection**].—*Ibid.* pp. 43-52. [In Russian: abst. from German summary].

I. A long and general review on brucella infection in man and animals, including a review of Estonian work and results. KARLSON, in a yet unpublished article, reports that he found that *Br. abortus* infection causes a greater drop in milk secretion than *Streptococcus agalactiae*. The work of RIDALA on the histology of the infected udder is described. Results of agglutination tests on Estonian herds

have varied very much, but it is evident that the percentage of infected cows is much larger on big farms than on small ones.

Br. abortus infection was made notifiable in 1932, and infected herds are placed under veterinary supervision. A voluntary eradication scheme, the details of which are given, is also in operation. The process of cleaning two large farms is described. Estonian research into the value of vaccines and chemotherapy has produced unpromising results.

II. Rolle refers to the agglutination titre and regards as positive strong agglutination at 1 : 50 and weak agglutination at 1 : 100. He advocates orthodox control measures, and also the use of live vaccine in heavily-infected herds. The disease was diagnosed in 150 herds in Latvia and has since been eradicated from 100 of them.

III. When the law for the control of animal diseases was passed in 1929 in Lithuania, *Br. abortus* infection was made notifiable and subjected to strict hygienic measures of control. In 1934, 460 positive cases were diagnosed.

The author speaks favourably of skin tests with culture filtrate, but does not express a definite opinion about vaccination.

In the discussion, the arguments centred round the standardization of the agglutination test and the use of live culture.

A resolution was passed drawing attention to the need for energetic control, and for the prohibition of vaccination or attempts at chemotherapy. Latvia, however, was invited to continue work with live vaccine and to report on it at the next congress. Further, the resolution advocated the formation of a voluntary eradication plan, and standardization of the agglutination test.—J. E.

WILSON, D. E. (1936). **The Pathogenicity of Tanganyika Strains of** *Brucella abortus* **and** *Br. melitensis* **for a Local Species of Monkey** (*Cercopithicus* **sp.).** —*J. Hyg., Camb.* **36.** 125-127. [8 refs.]

Both strains were isolated locally and were typical as regards H_2S production, reaction to monospecific sera and dye sensitivity. The *abortus* strain was, however, isolated without added CO_2. Four monkeys were inoculated with each organism and examined, culturally and for agglutinin production, after 32 days.

The four monkeys which received *Br. melitensis* all became ill; agglutinins were produced in all cases and cultures were positive. Three of the monkeys which received *Br. abortus* showed no illness; agglutinins did not develop nor were cultures positive. The fourth, which received a large dose estimated to be 10,500 million, remained well, but blood cultures were positive and the agglutinin titre was low.—A. W. STABLEFORTH.

BRISKIN, N. J. (1936). Allergičeskaja diagnostika brucelleza u svinej. [**Allergic Diagnosis of Brucella Infection in Swine**].—*Sovyet. Vet.* No. 1. pp. 10-13. 3 tables.

The author, with USOLTSEV, worked in Russia on the diagnosis of brucella infection in swine. USOLTSEV used " bangin ", a filtrate of a porcine strain introduced intradermally.

The author considers that the intradermal test is a useful complement to the agglutination test. The results are shown in a table.

I. GRÄUB, E., & ZSCHOKKE, W. (1936). Die Erfahrungen mit der keimfreien Filtratimpfung gegen den Rauschbrand. [**Inoculation against Blackleg with a Bacteria-Free Filtrate**].—*Schweiz. Arch. Tierheilk.* **78.** 97-103. 2 figs., 3 tables. [6 refs.]

II. FREI, W., & RIEDMÜLLER, L. (1936). Vorversuche zur Immunisierung

gegen Rauschbrand und Pararauschbrand. [**Immunization against Blackleg and Para-Blackleg**].—*Ibid.* 103-113.

III. Zschokke, W., & Saxer, E. (1936). Ueber die Verwendbarkeit des Hämolyse-Reagensglasversuches in der Rauschbranddiagnostik. [**Differentiation of Blackleg from Other Anaerobic Infections of Cattle by Haemolysis Test in Culture**].—*Ibid.* 113-123. 4 tables. [3 refs.]

I. A record of prophylactic immunization of cattle with cell-free bacterial filtrate. [The details of manufacture are not recorded but presumably the vaccine consists mainly of toxin, some bacterial substance also being probably present]. The use of this vaccine from 1926 to 1935 has resulted in a loss of only 0·35 per cent. of 80,000 inoculated animals from infections resembling blackleg. Where *Clostridium septique*, as well as *Cl. chauvoei*, was used for the preparation of the vaccine the percentage of loss among inoculated animals fell to 0·09. During the ten-year period losses from gas gangrene infections among uninoculated animals also fell slowly, and the authors consider that this indicates that the extensive vaccination campaign may eventually result in complete control.

II. The authors record an attempt to render strains of *Clostridium* avirulent by growing them in reducing systems.

The incorporation of sodium nitrate into medium did not influence blackleg and malignant oedema *Clostridia* since no nitrase was available to reduce the nitrate. This substance, however, when present in 1 per cent., reduced the toxicity of toxic filtrate without reducing its immunizing capacity. The replacement of nitrate by 2 per cent. of sodium hypochlorite rendered *Cl. septique* avirulent and practically destroyed its immunizing capacity. The addition of 0·03 per cent. of hydrogen peroxide acting for six days rendered cultures avirulent with slight loss of immunizing capacity. Gaseous oxygen only caused the cultures to sporulate. Study of a large number of reducing agents suggested that sodium nitrite was of greatest value when considered in relation to the concentration required and to the toxicity when inoculated into guinea pigs. [The use of oxidizing or reducing systems for rendering strains of *Clostridium* suitable for vaccine production is interesting and the results of these workers are promising. Vaccines containing toxoid and bacterial substances are, however, so highly effective that it is doubtful if there is any point in trying to replace them].

III. A study of the value of the haemolysis test for the differentiation of species of *Clostridium*. *Cl. chauvoei* rapidly haemolyses the red blood corpuscles of sheep and of cattle, even extracts of infected tissue having this property. Other members of the genus produced little or no haemolysis. [Considerable difference of opinion exists regarding the value of this test. Where any grave issue is at stake it would appear advisable to rely rather upon protection tests in small animals using specific antisera].—E. J. Pullinger.

Wiedemann, A. (1935). Die Rauschbranddiagnose mit dem Verfahren nach Riedmüller. [**Diagnosis of Blackleg by Riedmüller's Culture Medium**].—*Inaug. Diss., Giessen.* pp. 59. [Numerous refs.]

The following modifications of the technique advised by Riedmüller [this *Bull.* **4.** 650.] are advocated. The heating of material for the destruction of vegetative forms of bacteria should be at 70°C. for ten minutes, as 80°C. for 20 minutes is considered unnecessarily harsh treatment liable to lower the vitality of more delicate spores and delay or destroy their ability to germinate.

When seeding material on to the strip of agar, attention should be paid to the number of spores in the inoculum. If few in number, a heavy seeding should be made and *vice versa*, in order to obtain a reasonable distribution of colonies. The medium recommended is firmer than the original; it consists of 4 per cent. of

nutrient agar plus 0·3 per cent. of cystine and 0·5 per cent. of thiodiglycolic acid. This firm agar tends to dry out readily and the precaution should be taken of sealing the exposed edges with vaseline. Larger or smaller amounts of cystine and thiodiglycolic acid gave less satisfactory results. Glutathione can replace cystine, but it has no advantages and is more costly.—E. J. PULLINGER.

DAYUS, C. V. (1936). **Vaccination of Ewes against Pulpy Kidney (Infectious Enterotoxaemia) in Lambs.**—*N. Z. J. Agric.* **52.** 289-292. 3 tables.

Vaccine, prepared at the Wallaceville veterinary laboratory, was used in two doses on ewes to prevent pulpy kidney disease. The results were as follows :– of 812 vaccinated ewes, there were 2 losses from pulpy kidney disease, and of 840 control ewes, there were 59 losses. Vaccination was, therefore, considered to have yielded encouraging results. Antitoxin trials on mice performed at Wallaceville from colostrum and blood of lambs from vaccinated ewes showed that both contained appreciable quantities of antitoxin.

Further vaccination trials are being arranged.—C. S. M. HOPKIRK.

WEINBERG, M., GUILLAUMIE, M., & STAUB, A. (1935). Premier cas d'infection à *B. paludis* observé chez le mouton, en France. [*Clostridium paludis* **Infection of Sheep in France**].—*Bull. Acad. vét. Fr.* **8.** 502-504.

Cl. paludis was identified by cultural and toxin-antitoxin tests with known anti-*paludis* and anti-lamb dysentery bacillus sera. The organism was isolated from one of eight ewes dying from an acute infection near Arles-sur-Rhône.—J. E.

MASON, J. H. (1935). **The Bloedpens Strain of** *Cl. welchii*, **Type B, Wilsdon. (The " Lamb Dysentery Bacillus ").**—*Onderstepoort J. vet. Sci.* **5.** 363-389. 20 tables. [Numerous refs.]

" Bloedpens " is the name given in South Africa to a disease of lambs, corresponding to lamb dysentery of Great Britain. The causal organism appears to be identical, morphologically, in nearly all its cultural characters and, serologically, with the lamb dysentery organism as originally isolated. In common with this bacillus, it produces three main toxic fractions, the alpha, the beta and the epsilon. The toxin of an 18-hour culture consists chiefly of the beta and that of a five-day culture of the epsilon fraction. The lamb dysentery bacillus, at present in use, has lost the capacity of producing the epsilon fraction. The toxin of 18-hour and five-day cultures of *Cl. welchii* Type D (*Cl. ovitoxicum*, Bennetts) does not contain the beta fraction, being made up chiefly of the epsilon.

The results of a large number of titrations showed that the intradermic (in guinea pigs) method of titrating Type D toxins was unsatisfactory. The general impression gained from the work was that further research will reveal the presence of still more factions in the toxins of *Cl. welchii* Types A, B, C and D.

MASON, J. H. (1935). **The Production of Immunity against** *Cl. welchii*, **Type B, Wilsdon. (The " Lamb Dysentery Bacillus ").**—*Onderstepoort J. vet. Sci.* **5.** 391-416. 17 tables. [13 refs.]

The immunizing power of formol-toxoids was tested on guinea pigs. The total antitoxin-binding-power of a toxoid has a direct bearing on its immunizing capacity. Toxoid rendered slightly toxic by the addition of Type A or Type B toxin is a much better antigen than toxoid itself, but alum-toxoid or toxoid plus tapioca, saponin, colloidal iron or *Clostridium septique* toxin was not superior. Zinc chloride precipitates were better antigens and toxoid administered intraperitoneally gave better immunity than when injected subcutaneously. No indication was obtained that the production of a local reaction did, *per se*, increase immunity.

Boiled washed bacilli, containing no demonstrable toxin or toxoid, proved to be an excellent antigen when administered subcutaneously to guinea pigs and intravenously to goats. A high antitoxic immunity was produced.

—. (1936). Erkrankungen von Schweinen nach Verfütterung von sog. amerikanischer " Giftgerste ". [**Illness of Swine after Feeding on American " Scabby Barley "**].—*Tierärztl. Rdsch.* **42.** 499-500.

—. (1936). Verfütterung von sog. amerikanischer " Giftgerste ". [**Poisoning of Swine by American Barley (" Scabby Barley ")**].—*Tierärztl. Mitt.* **17.** 342.

These are reports of the same legal action taken by a farmer to recover damages for the loss of swine alleged to have been poisoned by " scabby barley ", the infecting fungus having been found in samples of the barley supplied.

[A fungus, *Gibberella saubinettii*, is a common parasite of barley grown in some north-central states of the United States of America. This inferior barley is classed as " Federal barley No. 2 " and is, or was, exported to Europe in large quantities. It is useless as a pig food, as this animal (also the horse and man) cannot tolerate it, vomiting badly after eating it. Death, however, never follows as a direct result. Ruminants and fowls can feed and thrive on it. It is a curious fact that in experiments it has been found that the fungus alone is harmless to pigs, as also is ripe barley on which cultures of the fungus are allowed to grow ; the fungus must grow on growing barley to render it noxious – see MUNDKUR (1934). *Phytopath.* **24.** 1237].—J. E.

JENNISON, M. W. (1935). **Some Quantitative Relationships in Bacterial Population Cycles.**—*J. Bact.* **30.** 603-623. 7 figs., 9 tables. [Numerous refs.]

Growth curves were prepared for two strains of *Bact.* (*Escherichia*) *coli*, and one strain of *Bact. aerogenes* (*Aerobact. aerogenes*), *Chromobact. prodigiosum* (*Serratia marcescens*), and of *Chromobact. violaceum*. The growth curves as a whole are typical of bacterial population cycles, showing a lag period, a phase of maximum rate of reproduction, and a long period of decreasing rate of growth. The organisms were " acclimatized " to 22°C. before being used for subculturing into the broths for the experiment. The growth curves were then determined at 22°, 27°, 32°, 37° and 42°C.

The opinion is expressed, that the presence of a lag period at 22°C. with all the organisms tested, when the inoculum was from cultures reproducing at a maximum rate at that temperature, needs further investigation, since it has previously been accepted that if the organisms are in the logarithmic growth phase, a subculture at the same temperature will show no lag.

At any temperature up to the optimum, the ratio of minimum generation time (in minutes) to length of logarithmic growth period (in hours) at the same temperature was approximately constant.—R. LOVELL.

GUITTONNEAU, G., & BRIGANDO, Jeanne. (1936). Observations relatives à la coloration des microbes préalablement chauffés dans le lait. [**The Staining of Micro-Organisms in Heated Milk**].—*Lait.* **16.** 577-587. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 712-713. Signed G. S. WILSON].

As several previous workers have noted, the authors have found that certain organisms, particularly those belonging to the so-called lactic group, may fail to stain by the usual methods in milk that has been heated. The direct microscopic count on pasteurized or sterilized milk may consequently be very misleading. They find, however, that such bacteria can be stained quite satisfactorily if the preparation is (1) exposed to the dye for 10-12 hours instead of for only a few minutes, (2)

subjected to the Ziehl-Neelsen hot carbol-fuchsin process, or (3) treated with 1 per cent. acetic acid before staining by the normal methods.

MENKIN, V. (1936). **Studies on Inflammation. XI. Invasiveness and Virulence in Relation to Resistance.**—*J. infect. Dis.* **58.** 81-91. 4 figs., 2 tables. [12 refs.]

The author inoculated a series of rabbits intracutaneously with a virulent strain of pneumococcus. On this was superimposed an injection of bacterial or chemical irritant, namely, *Staphylococcus aureus*, aleuronat or turpentine. Control rabbits received the first injection only. In each case it was found that the experimental rabbits survived for a longer period than the controls. An investigation of this phenomenon appeared to indicate that the increased resistance shown by the former was due to a delay in the spread of pneumococci from the site of inoculation and not to any modification in their virulence. Delay in spread in turn was ascribable to mechanical obstruction by thrombosed lymphatics and coagulated plasma, arising through the action of the irritant. The author concludes from these experiments that the rapidity of invasion of a micro-organism is modified by any local inflammatory reaction which may exist at the site, and that this is a significant factor in determining the resistance or immunity of the host. The virulence of any organisms that succeed in passing this inflammatory barrier is, however, unaffected.—C. DAVENPORT.

DISEASES CAUSED BY PROTOZOAN PARASITES.

VAN SACEGHEM, R. (1936). L'immunisation des bovidés contre la trypanosomiase. **[The Immunization of Cattle against Trypanosomiasis].**—*Bull. agric. Congo belge.* **27.** 47-50. 1 table. [1 ref.]

The author records the results of attempts to immunize cattle against *Tryp. congolense* infection by inoculating them with a guinea pig strain of this trypanosome before they are 14 days old. He states that there is no harmful result to health or growth and that after four to six months trypanosomes can no longer be found regularly in the peripheral blood. The negative periods gradually increase till no further trypanosomes can be detected and subinoculation of blood fails to produce infection. Reinoculation of such animals fails to produce reinfection and exposure in a herd badly infected with *Stomoxys*-transmitted trypanosomiasis failed to produce further disease. The records of attempts to reinfect six calves are given.
—U. F. RICHARDSON.

HOARE, C. A. (1936). **Morphological and Taxonomic Studies on Mammalian Trypanosomes. II.** *Trypanosoma simiae* **and Acute Porcine Trypanosomiasis in Tropical Africa.**—*Trans. R. Soc. trop. Med. Hyg.* **29.** 619-645. 2 figs., 3 tables, 1 map. [Numerous refs.] [For abst. of previous article see this *Bull.* **6.** 646].

The author reviews the report of trypanosomiasis in pigs and concludes that chronic disease in pigs may be due to *Tryp. brucei*, *T. congolense* or *T. uniforme*, but that acute trypanosomiasis is due to a polymorphic trypanosome as described by SCHWETZ and by BOURGUIGNON [this *Bull.* **5.** 617 and **6.** 502]. On a re-examination of Bruce's old slides of *Tryp. simiae* from outbreaks of acute porcine trypanosomiasis, it was found that these exhibited polymorphism, individuals being detected resembling *Tryp. congolense* and others resembling *Tryp. rodhaini*. A re-examination of WALRAVENS' films of *Tryp. rodhaini* showed that this trypanosome also exhibited polymorphism and appeared to be identical

with *Tryp. simiae*. A careful examination of specimens to ascertain the prevalence of forms with a free flagellum in these strains and that of SCHWETZ indicated that, though forms with an apparently free flagellum might be relatively numerous, in the majority of cases this appearance might be caused by a twist of the undulating membrane. A free flagellum varying in length from 1 to 4μ was undoubtedly present in a small percentage of individuals, this observation agreeing with the description given by BRUCE of *Tryp. simiae*.

A type of agglutination is described in which two or more individuals collide, coil around each other, and adopt a head to tail position in which they may remain for long periods. This type of agglutination is only encountered in the species *Tryp. congolense* and *Tryp. simiae*, and was interpreted by BRUCE as a form of division.

Discussing the type of division in the *Tryp. congolense* group of trypanosomes, the author points out that the fully formed daughter individuals have a linear arrangement with one of the partners overlapping the other, whereas in members of the *brucei-evansi* group they are united at the posterior extremity, giving a bifid appearance. The validity of records of acute porcine trypanosomiasis due to *Tryp. brucei* and *Tryp. uniforme* is also questioned, the former being explained as due to *Tryp. simiae*, and the latter to a mixed infection with *Tryp. simiae* and *Tryp. uniforme*.—U. F. RICHARDSON.

HERRICK, C. A., & CROSS, S. X. (1936). **The Development of Natural and Acquired Resistance of Young Rats to the Pathogenic Effects of the Parasite** *Trypanosoma lewisi*.—*J. Parasit.* **22.** 126-129. 2 tables. [4 refs.]

Young weaned rats, under 30 days old, proved very susceptible to both strains of *Tryp. lewisi* employed by the authors in the experiments recorded, suffering a mortality of about 80 per cent., whilst young sucking rats and adult rats, though susceptible to infection, suffered no mortality. The resistance in the young weaned rats could be raised to that of the other classes by the subcutaneous injection of oestrin or by implanting the pituitary gland of an adult non-immune rat.
—U. F. RICHARDSON.

I. GLASER, R. W., & CORIA, N. A. (1935). **Purification and Culture of** *Trichomonas foetus* **(Riedmüller) from Cows.**—*Amer. J. Hyg.* **22.** 221-226. 2 tables. [17 refs.]

II. FUTAMURA, H. (1935). **Studies on Trichomonas Abortion in Cattle.**—*J. Jap. Soc. vet. Sci.* **14.** 392-416. [In Japanese: abst. from English summary].

III. KÜST. (1936). Die Trichonomadensterilität des Rindes und ihre Bekämpfung. [**Trichomonad Sterility and its Control**].—*Dtsch. tierärztl. Wschr.* **44.** 177-181. 3 tables.

I. The author describes a method of purifying cultures of *Trich. foetus* by inoculating drops of the material to the bottom of a " V " tube containing a semi-solid gel prepared from Ringer's solution 50 c.c., 3 c.c. of 2 per cent. agar and one drop of rabbit or horse blood. The trichomonads are negatively geotropic and tend to migrate up the sterile arm of the " V " tube, from which material can be drawn after 16 to 22 hours for pure cultivation in Ringer's solution-egg-blood medium. The material is withdrawn with a sterile pipette from a layer about 2·5 c.c. above the inoculum. The migrations are performed best at room temperature, and under these conditions very little bacterial contamination of subcultures occurs, but if performed at incubator temperature contamination is common.

II. Records the detection of bovine abortion in Japan associated with *Trich. foetus* infection. Experiments on cultivation, transmission and artificial infection are recorded which confirm results obtained in Europe.

III. This article draws attention to the prevalence of trichomonad abortion in cattle in south and central Germany, and illustrates the loss caused by the disease by comparing the breeding records of infected and non-infected villages. Measures to be adopted for the control and eradication of the disease are suggested [see also this *Bull.* **6.** 24].—U. F. RICHARDSON.

SERGENT, Ed., DONATIEN, A., PARROT, L., & LESTOQUARD, F. (1935). Theilérioses bovines de l'Afrique du Nord et du Proche-Orient. [**Bovine Theileriasis in North Africa and the Near East**].—*Arch. Inst. Pasteur Algér.* **13.** 472-488. 6 plates. [18 refs.]

The authors dispute the contention of ADLER and ELLENBOGEN that the causal agent of the bovine theileriasis of Palestine constitutes a separate species of parasite from *Theileria dispar* and *Th. parva* [see this *Bull.* **6.** 585]. They present the results of a series of experiments undertaken by them in Algeria to demonstrate the points in common between *Th. dispar* and the Palestinian piroplasm. Their observations fall into four groups. Firstly, a discussion on some of the special characters of *Th. dispar* infection, namely, the varying virulence of different strains of the parasite, the lengthy incubation period of the disease and the loss of sexual form in the parasite attending its transmission by blood inoculation. Secondly, some notes regarding the survival of the Palestinian theileria and *Th. dispar in vitro* and the persistence of special forms of the parasite for long periods in the blood of naturally infected calves. These remarks are designed to show that, contrary to the claim made by ADLER and ELLENBOGEN, these characters are not peculiar to the Palestinian strain. Thirdly, a series of cross-immunity experiments carried out with both parasites. This record forms the main subject matter of the paper. For the purpose of these experiments calves known to be free from any piroplasm infection were specially imported from France. The strain of *Th. dispar* employed was taken from the authors' own laboratory stocks. The Palestinian parasite was specially obtained from ADLER in Jerusalem. Although the results they obtained with the two parasites were not identical, the authors consider that they indicate that the parasites belong to the same species. Lastly some comments on the proof required of a special transmitting agent for the Palestinian parasite are included.—C. DAVENPORT.

NISHIYAMA, M. (1936). Ueber das Vorkommen von Darmspirochäten bei Menschen und Tieren. [**Intestinal Spirochaetes in Animals and Man**].—*Zlb. Bakt. I.* (*Orig.*). **136.** 370-382. 2 figs., 6 tables.

Stools of human beings, other mammals, birds and reptiles were examined for the presence of spirochaetes. *Spirochaeta stenogyrata* or *Sp. eurygyrata* were found in the stools of 10 per cent. of children and 32 per cent. of adults. Species of spirochaete were also found in the faeces of a large variety of animals at the zoological gardens. Oral administration of a 1 : 300 saline dilution of "salvarsan" caused these organisms to disappear from the faeces of mice. [The presence of spirochaetes is of no particular significance since they are commonly found in decomposing organic matter and are usually to be found in association with carious teeth].—E. J. PULLINGER.

DISEASES CAUSED BY VIRUSES.

BENNETT, S. C. J. (1936). **Cattle Plague Vaccine. Studies on Glycerinised Spleen Pulp.**—*J. comp. Path.* **49.** 1-48. 12 tables. [Numerous refs.]

This article records the experimental study of glycerinized vaccines as pro-

tective agents against rinderpest, and more particularly the relative value of various tissues as vaccines, the period of retention of virulence, the interval before the conferring of immunity, the effect of storage and the duration of the immunity produced. Splenic vaccines were prepared by the removal of spleens from rinderpest-infected animals at the height of an acute febrile reaction, mincing the organs and adding double the weight of 60 per cent. glycerin.

It was found by experiment that virulence disappeared in three days at 37°C. and in about three months at 0°C., a few observations at intermediate temperatures affording intermediate results. The author considers that the vaccine can, therefore, be made quite safe for use in three days by placing it in the ordinary biological incubator. From experiments on the immunity interval it is concluded that some immunity is conferred by spleen-lymph-gland vaccines in three days, and complete immunity is conferred in seven days. Experiments on dosage indicated that doses under 0·5 g. per 100 kg. body weight did not give any satisfactory immunity, doses of 0·5 g. per kg. gave a working immunity, but the smallest dose of spleen-lymph-gland vaccine that could be relied on to produce solid immunity in a week was 1 g. per 100 kg. body weight. The limits of storage capacity were found to be one month at 37°C. and one year at 0°C., after which periods, although the vaccines may still possess some immunizing power, an increasing number of cattle fail to receive protection. Experiments were carried out to ascertain the value of spleen, lymph glands, thymus and lung tissue for vaccine manufacture. Lymph gland tissue gave rather better results than spleen or thymus, while lung tissue proved unsatisfactory.

In the Sudan, the selected tissues are minced and treated with glycerol at the Malakal laboratory. The product is either placed in cold storage at Malakal or sent in cold storage to Khartoum. Unless required for immediate use it is kept in this state as the antigenic value is better conserved in cold storage, and as prolonged soaking in glycerin renders the tissue easier to grind to a paste which will pass through an inoculating needle. In the grinding process the machine rejects the connective tissue, and this is discarded.—U. F. Richardson.

I. Fukushima, T., & Miyairi, K. (1935). **Pathology of Rinderpest. Part II. The Spleen.**—*J. Jap. Soc. vet. Sci.* **14.** 417-444. 8 figs. on 4 plates, 7 tables. [4 refs.] [In Japanese: abst. from German summary] [For abst. of previous article see this *Bull.* **5.** 71].

II. Saunders, P. T., & Ayyar, R. S. K. K. (1936). **An Experimental Study of Rinderpest Virus in Goats in a Series of 150 Direct Passages.**—*Indian J. vet. Sci.* **6.** 1-86. 2 figs. on 1 plate, 2 tables, 82 charts. [9 refs.]

III. Sarwar, S. M., & Handa, B. N. (1936). **A Severe and Widespread Outbreak of Rinderpest at the Government Cattle Farm, Hissar, and its Control by the Goat-Virus alone Method.**—*Ibid.* 100-107. 1 fig. [7 refs.]

IV. Froehner, R. (1936). Zur Geschichte der Pestis bovine in Deutschland. **[The History of Rinderpest in Germany].**—*Arch. wiss. prakt. Tierheilk.* **70.** 227-231.

I. The authors conclude, as a result of their examination of 56 spleens from cattle infected with rinderpest, that the weight of the spleen is usually below normal but that this loss of weight bears no constant relationship to the severity of the disease. Rinderpest causes a hypertrophy of the reticulo-endothelial tissue, the splenic follicles becoming filled with an increasing number of reticulum cells which undergo degeneration. No inflammatory reaction occurs around the invaded follicles. Large groups of vesicular-shaped cells are encountered, which undergo hyalin degeneration, and hyperhaemosiderosis takes place. Haemorrhages occur not only in the follicles but also in the pulp, in which the vesicular cells are likewise

occasionally encountered. The nuclei of the cells of the follicular lesions are, in most cases, pycnotic. Haemosiderin is largely increased in the splenic pulp and often becomes conspicuous.

II. This article records experiments to ascertain whether there is a progressive attenuation of the rinderpest virus by successive passages through goats, at what stage of the attenuation the virus is safe for use as a vaccine in cattle, and whether at a certain stage of the attenuation the virus becomes fixed in its virulence for goats. The virus was passaged through goats 150 times, two goats being subinoculated at each passage and one calf utilized as an indicator of the amount of attenuation for bovines. The reactions in goats throughout these passages were constant, and no marked variation occurred in the clinical symptoms or mortality. A strain of rinderpest virus from Muktesar gave similar results when passaged in local goats.

As regards attenuation for cattle, the mortality in the bovine controls of the first 50 passages was 52 per cent., of the second 50 passages 48 per cent., and of the third 50 passages 24 per cent. It is concluded that there was evidence of attenuation after 80 passages, but the ideal attenuation cannot be said to have been reached until the mortality rate and the severity of the symptoms have been reduced to the level considered satisfactory for serum-simultaneous inoculation.

III. The third article describes an outbreak of rinderpest amongst government herds affecting 6,784 animals. The type of disease is described as severe, lasting on the average seven days, but with only slight elevation of temperature. The disease was controlled by the inoculation of 5,848 animals with goat-blood virus or goat-tissue virus. 75 per cent. of the inoculated animals gave a temperature reaction to the blood virus and 50 per cent. to the tissue virus. It is stated that " the outbreak was brought under control within a period of 12 days with the loss of 18 animals from the time of vaccination or inoculation measures being undertaken."

IV. The fourth article reproduces a report of the College of Medicine, Vienna, on investigations into the epizootic of rinderpest in Germany in 1598-1599. The report is in Latin and discusses astronomical influences, climatic conditions and the contamination of air, water and food. Measures of control are recommended.

—U. F. Richardson.

Rafaelovitch, E. M. (1936). Vakcinacija kr. rog. skota protiv jaśćura chloroformvakcinoi. [**Vaccination against Foot and Mouth Disease with a Chloroform Vaccine**].—*Sovyet. Vet.* No. 5. pp. 59-61. 1 fig., 1 graph.

The author tested the prophylactic qualities of Galea's chloroform vaccine against foot and mouth disease, on an infected state farm at Semipalatinsk, Western Siberia. His conclusions, based upon experiments with several hundred head of cattle, were as follows :- (1) two intradermal injections of the chloroform vaccine (dose 1 c.c.), at an interval of 14 to 16 days, conferred immunity to foot and mouth disease for a fortnight only, and (2) after a third, subcutaneous injection of the vaccine (dose 2 c.c.) made five days after the second intradermal injection, cattle were immune for not less than a month.

Tsuwerkalow, D. A. (1936). Moča kak antigen dlja diagnostiki infekcionnoj anemii losadeji. [**Urine as an Antigen for the Diagnosis of Equine Infectious Anaemia**].—*Sovyet. Vet.* No. 1. pp. 37-39. 2 tables. [4 refs.]

The author applied the results obtained in swine fever work to a diagnostic test of equine infectious anaemia. A filtered extract was used : the method of preparing the extract is described, but is not clear.

As test material with the rabbit serum, the author used mucus from the eyes

of healthy and infected horses and obtained results that were specific, the material from the healthy horses yielding negative results.

I. Olitsky, P. K., & Cox, H. R. (1936). **Active Immunization of Guinea Pigs with the Virus of Equine Encephalomyelitis. I. Quantitative Experiments with Various Preparations of Active Virus.**—*J. exp. Med.* **63.** 311-324. 7 tables. [23 refs.]

II. Cox, H. R., & Olitsky, P. K. (1936). **Active Immunization of Guinea Pigs with the Virus of Equine Encephalomyelitis. II. Immunization with Formolized Virus.**—*Ibid.* 745-765. 8 tables. [20 refs.]

III. Merrill, M. H. (1936). **Quantitative Studies on the Neutralization of Equine Encephalomyelitis Virus by Immune Serum. I. Combination of Virus and Antibody in Vitro. II. The " Percentage Law ".**—*J. Immunol.* **30.** 185-192 and 193-202. 6 tables. [9 refs.]

IV. Doyle, L. P. (1936). **Encephalitis in Horses.**—*J. Amer. vet. med. Ass.* **88.** 636-641. 6 figs.

V. Simmons, J. S., Reynolds, F. H. K., & Cornell, V. H. (1936). **Transmission of the Virus of Equine Encephalomyelitis through Aedes albopictus, Skuze.**—*Amer. J. trop. Med.* **16.** 289-302. 4 tables. [10 refs.]

I. Having determined the minimum quantity of equine encephalomyelitis virus (eastern and western strains) required for inducing a resistance in guinea pigs to experimental infection, three forms of antigen were studied for their immunizing value, *viz*, virus adsorbed on aluminagel, precipitated by tannic acid, and passaged through mice respectively. It was found that one or two sublethal doses of 1 c.c. of virus, containing from 3×10^3 to 3×10^4 mouse infective units, regularly induced protection in guinea pigs when exposed to nasal or subcutaneous infection. Adsorbed or precipitated virus gave almost identical results.

II. Guinea pigs and mice were protected against infection by formolized suspensions in which the virus was entirely inactivated or was present in amounts which; of themselves, were too small to induce an active immunity. The vaccines were prepared from mouse or guinea pig brains treated with from 0·8 per cent. up to 2 per cent. of formalin and kept at room temperature for from one to four days. Guinea pigs were rendered resistant to as many as 1,000 intracerebral lethal doses. The most satisfactory results were obtained with two subcutaneous injections at intervals of a week. The immunity lasted for from three to seven months.

It is suggested that, by the use of formolized suspensions in horses, the danger of circulating virus during immunization would be removed while the animals might be rendered resistant to the disease for a length of time sufficient to be of practical value.

III. A different effect is obtained by adding immune serum to undiluted virus of equine encephalomyelitis and then preparing serial dilutions, to that resulting from diluting the virus and serum separately and then mixing. In the former case the titre of the virus is only 10^{-4}, whereas in the latter it is 10^{-6}. The filtrability of virus, treated with immune serum in amounts insufficient to cause complete inactivation, was materially diminished, suggesting that aggregation of the virus particles had occurred.

The experiments described in the second part of this paper indicate that, when a virus is neutralized by an immune serum, both agglutination of particles and neutralization are taking place. The phenomenon of " percentage neutralization " is probably closely linked with this aggregation of the virus particles.

IV. *Post-mortem* examinations were made on a number of horses in Indiana which were affected with encephalitis. Conspicuous lesions were present in the

brains, consisting of softened, yellowish areas in the cerebrum which were sometimes of sufficient dimensions to involve the greater part of a hemisphere. In two instances guinea pigs injected with cerebral material developed an encephalitis within ten days. The relationship of the disease to equine encephalomyelitis has not yet been determined.

V. It has been shown by KELSER [this *Bull.* **4.** 107.] that *Aedes aegypti* is capable of transmitting the virus of encephalomyelitis to normal guinea pigs and horses: in addition, MERRIL, LACAILLADE and TEN BROECK have noted that *A. sollicitans* and *A. cantator* can also act as vectors [this *Bull.* **5.** 500]. In the present paper evidence is advanced that *A. albopictus* can transmit the virus to normal guinea pigs up to the 38th day.—R. E. GLOVER.

TCHERNIAK, V. Z., & RASTEGAEVA, A. M. (1935). Nabljudenija nad boleznja *Aujeszky* (infekcionnim bulbarnim paraličom, loznim besenstvom). [**Aujeszky's Disease**].—*Sovyet. Vet.* No. 10. pp. 31-39. [French summary: abst. from orig.]

This disease is but little known in Russia. The authors can only find one case of it mentioned in Russian veterinary literature, namely that of a cow at Dorogobuzsk (Smolensk Government) in 1912 (mentioned by IZABOLINSKY and PACEVIC). They quote, however, CADÉAC's opinion, namely that Aujeszky's disease is rather frequently unrecognized than rare. Details of six cases (1934-1935) in Leningrad (a cat and five dogs) are given, also of materials sent to Leningrad from Spitzbergen (19th December, 1934) where five cows and 20 dogs had died of the disease.

I. DENISON, G. A., & HUNTER, F. R. (1936). **The Control of Rabies in a Southern City [U.S.A.]**—*N. Amer. Vet.* **17.** No. 6. 42-50. 6 figs., 3 tables. [1 ref.]

II. BALOZET, L. (1936). La vaccination antirabique des animaux en Tunisie du 1er janvier au 31 décembre 1935. [**Antirabic Vaccination of Animals in Tunis in 1935**].—*Arch. Inst. Pasteur Tunis.* **25.** 353-361. [4 refs.]

III. YAOI, H., KANAZAWA, K., & SATO, K. (1936). **Ultrafiltration Experiments on the Virus of Rabies (Virus Fixe).**—*Jap. J. exp. Med.* **14.** 73-79. 5 tables. [11 refs.] [In English].

I. The control of rabies in Birmingham, Jefferson County, is described. Since 1925 rabies has steadily increased in the county and in 1934 control measures were instituted, the most important being the compulsory licensing of all dogs over four months old, licences only being issued on the production of a certificate of annual vaccination. In addition, propaganda and the destruction of stray dogs are practised. There appears to be no uniformity in the technique of vaccine production, which is undertaken by a number of manufacturers, except that all vaccines are of the fixed virus type containing phenol. As a result of these measures, canine rabies has been reduced by 66 per cent., the mortality rate being 0·8 per 1,000 among vaccinated and 6·3 per 1,000 among unvaccinated dogs. In the surrounding uncontrolled area rabies remained unabated.

II. Antirabic vaccination of animals in Tunis commenced with the preparation of vaccines in 1931, the method followed being that of REMLINGER and BAILLY with the employment of etherized virus. In the control of rabies two methods are used, preventive vaccination with or without annual revaccination, and curative vaccination. Since commencing this work, no dog given preventive vaccination with or without revaccination following a bite from a rabid dog has contracted rabies. Of 56 herbivores that were given curative vaccination following infection, one horse and three bovines died.

III. Six ultrafiltration experiments with a fixed virus "fukuoka" were conducted, using the graded collodion membrane of ELFORD, in an attempt to estimate the size of the virus of rabies. The virus readily passed through a membrane of an A.P.D. greater than 0·33μ and was retained by one below an A.P.D. of 0·2μ; this is the end-point and the authors regard the size as being from 0·1 to 0·15μ.—R. FISHER.

PAWAN, J. L. (1936). **The Transmission of Paralytic Rabies in Trinidad by the Vampire Bat** (*Desmodus rotundus murinus* Wagner, 1840).—*Ann. trop. Med. Parasit.* **30.** 101-130. 4 figs. on 1 plate, 4 tables, 2 maps. [Numerous refs.]

This paper describes continued investigations into the spread of paralytic rabies which was first observed in Trinidad in 1925. The outbreak was characterized by the absence of cases in the large dog population or other carnivora, and absence of transmission from animal to animal by biting. In 1931, stock-owners in infected areas noticed that their animals were being unduly bitten by the vampire (blood-lapping) bats, and these were thought to be in some way responsible. 157 bats were examined for Negri bodies but all proved negative. Bats showing abnormal habits were then searched for and examined and Negri bodies were found in the hippocampus of 22. When injected into experimental animals brain emulsion from these latter cases invariably caused rabies. Serum neutralization tests were also carried out and the author concludes that the *Desmodus* bat is the transmittor of paralytic rabies in Trinidad.—R. FISHER.

DU TOIT, P. J. (1936). **Wild Carnivora as Carriers of Rabies.**—*Quart. Bull. Hlth Org. L.o.N.* **5.** 162-165. 1 table.

A brief account of wild carnivorous carriers of rabies in South Africa, where the disease has established itself in small veld carnivora of the meercat type belonging to the zoological family of Viverridae. It is not known how or when infection was introduced and little is known regarding transmission, incubation period, symptoms and duration of the disease in these animals. The only hope of control lies in results that may develop from active research into the life-history and habits of these pests.—R. FISHER.

I. GORET, P. (1936). Essai de traitement de la maladie de Carré par un sérum spécifique homologue. [**Treatment of Dog Distemper by a Specific Homologous Serum**].—*Bull. Acad. vét. Fr.* **9.** 218-225. [2 refs.]

II. WHITNEY, L. F. (1936). **Resistance to Distemper in the Pregnant Bitch.**—*Vet. Med.* **31.** 254-258. 1 graph.

I. The author describes the treatment of 27 cases with a homologous antidistemper serum made by the method described by PLANTUREUX [see this *Bull.* **6.** 336]. The author considers that, if employed before the appearance of bronchopneumonic complications, the serum is an effective therapeutic aid. He points out, however, that though in his experience one dose of 20 c.c. of serum may cause an apparent recovery, a second dose should be given in from eight to 15 days to prevent a relapse. Even when complications of distemper have appeared, the serum should be administered as, in these cases also, it is definitely of value.

II. The author attempts to demonstrate that a pregnant bitch resists distemper better than other dogs, though an actual immunity to the disease is not apparently present. Evidence is produced to show that when infected such bitches may resorb the embryos. Treatment with liberal doses of antidistemper serum is said to prevent this occurrence.

[Acceptance of these claims will be dependent on the accuracy of the diagnosis of early pregnancy by palpation, the measure of accuracy claimed by the author being difficult to accept].—G. F. Boddie.

I. Dochez, A. R., Mills, K. C., & Kneeland, Y., Jr. (1936). **Studies on the Virus of Influenza.**—*J. exp. Med.* **63.** 581-598. 11 charts. [20 refs.]

II. Francis, T., Jr., & Shope, R. E. (1936). **Neutralization Tests with Sera of Convalescent or Immunized Animals and the Viruses of Swine and Human Influenza.**—*Ibid.* 645-653. 1 table. [8 refs.]

III. Francis, T., Jr., & Magill, T. P. (1936). **The Incidence of Neutralizing Antibodies for Human Influenza Virus in the Serum of Human Individuals of Different Ages.**—*Ibid.* 655-668. 5 tables, 2 charts. [11 refs.]

IV. Shope, R. E. (1936). **The Incidence of Neutralizing Antibodies for Swine Influenza Virus in the Sera of Human Beings of Different Ages.**—*Ibid.* 669-684. 2 text figs., 2 tables. [18 refs.]

V. Hamer, W. H. (1936). **The Endemic Influenza Prevalences of the Three Years 1933, 1934 & 1935, together with Some Comments thereon, in the Light of Recent Literature concerning Influenza.**—*J. State Med.* **44.** 125-145. 3 figs., 1 graph.

I. In 1931 [this *Bull.* **2.** 502.], the authors reported the cultivation of the virus of influenza in a special medium. In the present article, they give details of tests for pathogenicity of several culture strains on human volunteers. Amongst other results, the experiments showed that infection with a culture virus did not necessarily confer a solid immunity against the homologous strain. Infectivity was demonstrated in one instance after more than 100 transfers in culture. The cultivated viruses usually induced symptoms of a severe common cold, but in one instance an influenza-like condition was induced.

II. In these experiments, the protective powers of sera from animals immune to either human or swine influenza virus were tested. These viruses were consistently neutralized by their homologous immune sera. Animals immunized or hyperimmunized against the swine virus yielded sera which sometimes afforded partial protection against human virus. The sera of ferrets or swine recovered from infection with human virus exerted little if any protection against the swine virus, but hyperimmunization frequently gave sera with strong heterologous neutralizing activities.

III. These tests were undertaken in order to demonstrate protective antibodies against influenza virus in human subjects. Groups of various ages were tested. Amongst those persons who had suffered from influenza, 87 per cent. possessed sufficient antibodies to neutralize the virus completely. The sera of other groups afforded only partial protection. The significance of these findings in relation to exposure to influenza are discussed.

IV. Shope has made a study of the antibodies against swine influenza in the sera of human beings [these are compared with the results of Francis and Magill—see III]. The sera of a high proportion of adults above the age of 12 neutralized the swine influenza virus. Some of these sera completely protected against both human and swine viruses, while in other cases complete neutralization against one virus and partial against the other was noted. These results seem to imply that the presence of antibodies is not necessarily dependent upon repeated exposure to human infection. Shope also discusses the possibility that the present strains of swine virus represent a surviving form of the human pandemic of 1918.

V. A highly speculative article on the influence of changing anabolic and katabolic phases on influenza endemics.—R. E. Glover.

ARMSTRONG, C. (1936). **Prevention of Intravenously Inoculated Poliomyelitis of Monkeys by Intranasal Instillation of Picric Acid.**—*Publ. Hlth Rep., Wash.* **51.** 241-243. 1 table. [2 refs.]

It has already been shown that the intranasal instillation of picric acid is highly effective in preventing the ingress of poliomyelitis virus administered by the same route. In this paper it is shown that similar treatment also affords a moderate protection against virus given intravenously.—R. E. GLOVER.

SABIN, A. B. (1936). **The Protective Action of nasally Instilled Immune Serum against Infection with Certain Neurotropic Viruses by Way of the Nose.**—*J. exp. Med.* **63.** 863-876. [11 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 726. Signed G. S. WILSON].

Working with the pseudorabies virus in guineapigs and the virus of equine encephalomyelitis in mice, it was found that the intranasal instillation of immune serum was able to protect the animals against subsequent nasal infection with the corresponding virus. The protective effect was apparent immediately, was still evident 5 hours later, and usually disappeared within 24 hours. Since chemical substances, such as 1 per cent. tannic acid or 0·1 per cent. neutral acriflavine, were devoid of this effect, the suggestion is that the immune serum acts by direct neutralization of the virus.

HERZBERG, K. (1936). Der Vorgang der Vakzinevirusvermehrung in der Zelle. **[The Intracellular Multiplication of Vaccinia Virus].**—*Zlb. Bakt. I. (Orig.).* **136.** 257-260. 1 plate. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 725. Signed G. S. WILSON].

Vaccinia virus was cultivated on the chorio-allantoic membrane of the developing chick embryo, and preparations were made at intervals during the next 36 hours and stained by Victoria blue. About 12 hours after inoculation 5-10 violet elementary bodies were visible in a given cell. These increased in number till after about 24 hours 30-100 bodies could be seen. At this stage larger deeply stained bluish-black spherical bodies became visible. The elementary bodies continued to increase, and, eventually, the cell burst and the bodies were released. The various stages of multiplication are well illustrated by accompanying photomicrographs. It seems probable that the larger spherical bodies represent microcolonies of the virus and correspond to Guarnieri corpuscles.

SEDDON, H. R., & HART, L. (1936). **Infectivity Experiments with the Virus of Laryngotracheitis of Fowls.**—*Aust. vet. J.* **12.** 13-16. 1 fig. [1 ref.]

The abstract on this paper was included in that given in this *Bull.* **6.** 746-747, which should be consulted.

LAIDLAW, P. P., & ELFORD, W. J. (1936). **A New Group of Filterable Organisms.**—*Proc. roy. Soc. Ser. B.* **120.** 292-303. 2 figs. on 1 plate. [14 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 724-725. Signed G. S. WILSON].

From different samples of London sewage filter-passing micro-organisms have been cultivated which bear some resemblance to the organisms of pleuro-pneumonia and contagious agalactia. Their isolation was accomplished by filtration of clarified sewage through gradocol membranes with average pore diameters of 1·0μ, 0·8μ and 0·6μ, and inoculation of 0·5-1·0 c.c. of the filtrate into Fildes' broth or on to Fildes' agar slopes. After incubation at 30°C. for a few days growth became detectable by the changes in colour and slight haziness in the broth medium, or by the appearance of colonies in the agar medium. Morphologically, the organisms vary considerably in size, the smallest forms being about

$0{\cdot}2\mu$, the largest about $0{\cdot}5\mu$ in diameter. Coccoid forms, signet-ring forms, and sometimes drum-stick forms are seen under dark-ground illumination. The mode of multiplication is still doubtful. The organisms grow best in Hartley's horse digest broth, pH 8·0, enriched with Fildes' peptic digest of red cells. On a solid medium a very faint ground-glass appearance is seen, but if a small inoculum is made colonies up to 0·35 mm. in diameter may develop in 5 or 6 days. Serological study showed that two of the three strains examined were antigenically unrelated. The organisms appear to be non-pathogenic. In filtration experiments with gradocol membranes no sharp end-point could be obtained. A certain proportion of the organisms were held back by a membrane with an A.P.D. of $1{\cdot}0\mu$, but it was not till a membrane with an A.P.D. of $0{\cdot}25\mu$ was used that complete retention was obtained. In this respect the organisms resemble the pleuropneumonia organism rather than the pathogenic filtrable viruses. The classification of these organisms is doubtful ; there is no reason to believe that they are related to the filtrable forms of ordinary bacteria. [This paper is of such obvious interest that those working on filtrable viruses are recommended to study it, if possible, in the original].

WOLLMAN, E., & WOLLMAN, E. (1936). Recherches sur le phénomène de Twort-d'Hérelle (bactériophagie ou autolyse hérédo-contagieuse). **[Research on the Twort-d'Hérelle Phenomenon (Bacteriophage or Transmitted Autolysis)].**—*Ann. Inst. Pasteur.* **56.** 137-164. 5 figs. [Numerous refs.]

This is a lengthy discourse on the nature of the agent involved in the Twort-d'Hérelle phenomenon, more particularly as to whether the conception of it as a living virus is correct (the parasitic theory), or whether the phenomenon is merely a manifestation of autolytic action (the enzyme theory).

The author first shows that, although spores of *Bacillus megatherium* retain their lysogenic properties when submitted to various special forms of treatment, similar results can be obtained with *B. subtilis* if this organism is first subjected to the action of its own bacteriophage. The paper then passes on to a comparison of the properties and behaviour of autolysins and bacteriophages and the mechanism and significance of the phenomenon of transmitted autolysis. There is also a note on the autolysis of bacteria occurring in the presence of antiseptics.—C. D.

LOGRIPPO, G. A. (1936). **Concerning the Nature of the Globoid Bodies.**—*J. Bact.* **31.** 245-253. 3 figs., 1 table. [5 refs.]

A series of experiments was undertaken to determine the nature of the "globoid" bodies described by FLEXNER and NOGUCHI. It is suggested that they are of the nature of lipoidic granules derived from the neurofibrils. The opalescence seen in poliomyelitis virus cultures can be reproduced in the medium in the absence of virus by the production of an electric field, and is probably due to the passage into suspension of these tissue lipoids. The chemical nature of these bodies was established by noting the lowering of surface tension as the opalescence increased, and their reaction to osmic acid.—R. E. GLOVER.

PARASITOLOGY (ARTHROPODS IN RELATION TO DISEASE).

STEVENSON, L. (1935). **Warble Fly Control in Ontario.**—*65th Ann. Rep. ent. Soc. Ont. 1934.* pp. 81-83.

The efficiency of a derris compound was tried out in a township area with the co-operation of the 34 farmers resident therein, who owned 800 cattle. The treatment, repeated twice at 30-day intervals, consisted in wetting the warbled

areas with the derris compound and scrubbing vigorously with a stiff brush. As a result, 10,026 grubs were killed on these cattle. The work was continued during the next two years and extended to another area containing 18,000 cattle, with satisfactory results. In 1934 the control programme was extended to more counties, containing approximately 110,000 cattle.

All cattle were treated twice, most of them three times, and a few four times, apparently with marked success. It was noted that in dairy herds where common fly sprays are much used for repelling the common stable fly, the hatchability of warble fly eggs was considerably reduced.

In some herds larvae appeared in June and July, indicating the need of a late June treatment.—E. A. WATSON.

I. BARTELS. (1936). Was muss der Tierarzt von der Dasselfliege und ihrer Bekämpfung wissen ? [**Biology and Control of the Ox Warble in Germany**]. —*Tierärztl. Rdsch.* **42.** 355-359 and 384-387. 4 figs., 2 tables. [3 refs.]

II. PEDRETTI, L. (1936). Erfolgreiche Dasselbekämpfung in Steiermark und in Tirol durch die chemische und mechanische Einzelbehandlungsmethode. [**Warble Fly Control in Styria and the Tirol**].—*Münch. tierärztl. Wschr.* **87.** 115-117.

III. GOERTTLER. (1936). Dasselplage und Dasselbekämpfung in Preussen im Jahre 1935. [**Control of Warble Flies in Prussia in 1935**].—*Dtsch. tierärztl. Wschr.* **44.** 183-185.

I. A general article with special application to German conditions and legislation. Three seasons of compulsory control have now elapsed but, judging by tannery statistics for the Hamburg district, the pest does not seem to have decreased during that time.

II. A description of warble fly control in part of Austria, where both chemical larvicides and the hook method were employed, with good results. Statistics for individual districts are given.

III. The percentage of incidence of warble larvae in cattle in administrative areas is given ; it varied considerably. Derris washes alone were used. Anaphylaxis was seldom observed. In some districts a reinspection after a single treatment was carried out, and it was shown that in many cases a considerable percentage of the treated animals still harboured live larvae.—J. E.

PARASITOLOGY (DISEASES CAUSED BY HELMINTH PARASITES).

WOLTER, E. (1935). Beitrag zur Biologie des Gänsemagenwurmes Amidostomum anseris (Zeder, 1800). [**Biology of the Gizzard Worm of Geese,** *A. anseris*]. —*Inaug. Diss., Berlin.* pp. 35. 2 charts, 1 map. [Numerous refs.]

The author gives a brief historical sketch and description of *A. anseris.* He studied its distribution and found it to be most harmful in the neighbourhood of lakes and rivers, and on marshes. The greatest incidence occurred from July to September, but the parasite was observed as late as December and as early as February. An account is given of the life-history, but nothing seems to be added to what was already known.—E. L. TAYLOR.

I. BERBERIAN, D. A. (1936). **Some Observations on the Effect of Digestive Juices on Scolices of** *Echinococcus granulosis* (**Batsch**).—*J. Helminth.* **14.** 21-40. 4 figs. on 1 plate, 2 tables. [Numerous refs.]

II. KELLER. (1936). Untersuchungen über die Lebensfähigkeit und Invasionstüchtigkeit der Rinderfinne bei −1° bis −1·5°C. [**Viability of Bovine**

Cysticerci after Freezing at -1° to -1·5°C.]—*Z. Fleisch- u. Milchhyg.* **46.** 189-191. 2 tables.

III. WINDHAUSEN, R. (1935). Untersuchungen über die Lebensfähigkeit u. Invasionsfähigkeit der Rinderfinne nach dem Gefrieren bei einer konstanten Temperatur von -3°C. [**The Viability of Bovine Cysticerci after Freezing at -3°C.**]—*Inaug. Diss., Giessen.* pp. 39. 4 tables. [Numerous refs.]

IV. COUTELEN, F. (1936). Les oiseaux domestiques peuvent-ils héberger spontanément des hydatides échinococciques et prendre place dans le cycle évolutif normal du ténia échinocoque ? [**Domestic Fowls as Possible Intermediate Hosts of Echinococcus**].—*C. R. Soc. Biol. Paris.* **121.** 490-493. [4 refs.]

I. The gastric juices of rats, dogs, cats, sheep and cattle were found to have no action in digesting the living scolices of *E. granulosus*, and the gastric juice of rabbits to exert only a retarded digestive action. The intestinal juices of human beings, rats, rabbits, sheep and cattle had a powerful digestive action, but not so that of dogs and cats. It is thought that natural immunity to this tapeworm is primarily dependent upon the digestive action of the intestinal juices of the unsuitable host.

II. Viability of the cysticerci was tested by trials for evagination in ox bile, and infectivity by passage through the human intestine in collodion capsule, uninfective cysts being killed and afterwards digested during this process. It was found that from -1° to -1·5°C. was not a sufficiently low temperature to freeze the cysts. Cysts remained alive for 23 days, and infective for 11 days at that temperature.

III. Cysticerci were exposed to -3°C. in pieces of flesh and it was observed that exposure for 36 hours to that temperature killed the cysticerci, 24 hours did not kill but destroyed their infectivity, 12 hours' exposure to -3°C. had the same effect as did also one hour's actual freezing of the cyst at that temperature. Meat should, therefore, be held at -3°C. until the deepest parts have been at that temperature for one hour.

IV. There have been several reports of the observation of echinococcus cysts in fowls. Coutelen attempted to produce secondary echinococcosis by intraperitoneal injection of the scolices into pigeons, fowls and turkeys but failed in every instance. He concluded that domestic birds play no part in the life history of this parasite [see this *Bull.* **6.** 748].—E. L. TAYLOR.

STOLL, N. R. (1935). **Tapeworm Studies. I. Restricted Pasture Sources of Moniezia Infection in Sheep. II. Persistence of the Pasture Stage of** *M. expansa.*—*Amer. J. Hyg.* **21.** 628-646 and **22.** 683-703. 3 figs. [Numerous refs.]

STOLL, N. R. (1936). **Tapeworm Studies. III. Sheep Parasitized with One** *Moniezia expansa* **Each.**—*J. Parasit.* **22.** 161-179. 6 figs., 1 table, 1 graph. [6 refs.]

I. Stoll gives an account of the occurrence of *Moniezia* in sheep on the Rockefeller Institute farm from 1927 up to the date of publication, and the association of infection with the various pastures on the farm. The infection was found to be almost entirely restricted to sheep which had grazed on a small low-lying pasture. Susceptible sheep placed on this pasture usually became infected but those placed on pastures situated as near as 100 feet, but on higher ground, did not do so. 114 cases occurred during the period 1927 to 1934 on the infected pasture, while 105 sheep that grazed other pastures near by, for an average of 11 months each over the same period, did not become infected. In the same years no infection with *Moniezia* occurred in 144 lambs kept indoors for an average of nearly five

months each. These observations are thought to support the theory of direct infection through soil or herbage contamination, as it is difficult to conceive of an intermediate host, unless it is a plant, which would not provide an opportunity for the infective stage to spread to new areas.

II. The observations referred to in the previous paper enabled Stoll to gather some data on the longevity of the larval stage of *M. expansa* in the pasture at the institute farm. In one instance the pasture was observed to have retained its infectivity for 17 and a half months, and in another instance for 22 months, each period including two winters. The poor infectivity of the pasture during a period of drought was observed, and infection was found to occur in any month throughout the year. These observations are again thought to favour the theory of a direct life-cycle.

III. The two infections were produced by exposing sheep for seven and one-third hours in November and eight hours in January respectively on infected ground. Proglottids were passed over a period of 54 days in one instance and 77 days in the other. It was estimated that about 4,000 proglottids were produced containing between 40 million and 80 million eggs during the stage of active reproduction, over the 54 days in the first observation.—E. L. Taylor.

Jones, Myrna F. (1936). *Metroliasthes lucida*, **a Cestode of Galliform Birds, in Arthropod and Avian Hosts.**—*Proc. helminth. Soc. Wash.* **3.** 26-30. 1 fig., 1 table.

The author's research on the life-history of *M. lucida* has shown that the grasshoppers *Chorthippus curtipennis*, *Paroxya clavuliger*, *Melanoplus* sp. and *Schistocerca dumnifica*, and the beetles *Aphodius* sp. and *Cratacanthus dubius* can act as intermediate hosts. The time necessary for development of the infective cysticercoid in the insect hosts varies from 15 days to six weeks. Approximately three weeks are required for the development of the adult worm. One guinea fowl was observed to remain infected for 134 days.

Description of larval and adult stages are given.—E. L. Taylor.

Shaw, J. N. (1934). **Lungworms** (*Dictyocaulus filaria* Rudolphi) **in Sheep and Goats.**—*Bull. Ore. agric. Exp. Sta.* No. 327. pp. 12. 3 figs., 2 tables. [5 refs.]

Among these miscellaneous observations on *D. filaria* in sheep Shaw here reports on the clinical result of feeding doses of from 400 to 26,000 infective larvae to lambs. In some of the groups the growth of infected lambs was found to be considerably retarded ; lambs were also observed to be much more susceptible than mature sheep and the life of the adult parasites to be very brief, no lambs remaining infested for more than 56 days. Five of six guinea pigs which were successfully infected with the larvae died as a result of pneumonia produced by the larvae. Numerous chemicals were tried *in vitro* and *in vivo*, but nothing was found which promised to be successful in treatment. Evidence was obtained however, which suggested that good feeding has a powerful influence in building up the resistance of the sheep.—E. L. Taylor.

Janicki, M. (1934). Contribution à la biologie de Dioctophyme renale Goese [Goeze]. [**The Biology of** *D. renale*].—*C. R. Sci. math. nat. Acad. polon.* No. 3. p. 5. [Copied *verbatim* from *Helminth. Abstr.* **3.** 151. Signed B. G. P.]

Janicki records *Dioctophyme renale* from the thorax of a cat, the first record from this host, and makes some observations on copulation and on the spermatozoa of this species.

IMMUNITY.

ZEISSIG, A. (1936). **Hypersensitivity in Domestic Animals.**—*J. Amer. vet. med. Ass.* **88.** 139-153. 2 figs., 2 tables. [15 refs.]

This is a review of the factors involved in the phenomenon of hypersensitivity, rather than an account of the condition as met with in domestic animals. The author points out that diseases of this type are rare and difficult to detect in animals. He then shows that the mechanism of the phenomenon has its basis in the reaction of antibody to antigen and is similar in every way to the mechanism responsible for immunity.

Antibody production and the factors influencing it are reviewed and the stages in the development of the hypersensitive state are discussed, *viz*, sensitization, incubation period, and re-exposure to antigen. The possible portals of entry to the body of the sensitizing substances are discussed. The paper then passes to a consideration of the symptoms of the reaction, methods of desensitization, detection of the state of hypersensitivity and the therapeutic measures indicated. Finally there is a short review of clinical manifestations of the phenomenon, namely, anaphylaxis, food idiosyncrasy, respiratory hypersensitiveness and allergic reactions.

—C. DAVENPORT.

BORDET, P. (1936). Contribution à l'étude de l'allergie. (Premier mémoire). L'allergie non-spécifique. **[Contribution to the Study of Allergy. I. Non-Specific Allergy].**—*Ann. Inst. Pasteur.* **56.** 325-352. [Numerous refs.]

While experimenting to find if inoculation with BCG vaccine would modify the peritoneal resistance of guinea pigs to infection with *Bact. coli*, the author found that he could evoke the appearance of a non-specific hypersensitiveness. Guinea pigs vaccinated intraperitoneally with 5 mg. of BCG and injected intraperitoneally five to ten days later with a culture of *Bact. coli* died in from four to ten hours, while controls survived much longer. A similar sensitivity was observed to killed cultures of *Bact. coli* and to culture filtrates. Culture filtrates of *Proteus vulgaris* produced a similar result. In each case *post-mortem* examination showed the presence of a blood-tinged peritoneal exudate and acute congestion of the peritoneal nodules developed following the BCG vaccination. The appearance of the hypersensitiveness and its duration appeared to depend upon the development and persistence of these lesions. Analogy is drawn between this phenomenon and those studied by SANARELLI and by SHWARTZMAN. In each case the injection of thermostable microbial products can cause an intense haemorrhagic reaction to appear in a few hours at the site of some sensitized region, be it due to an infection or, as found by SHWARTZMAN, to injection of a bacterial filtrate.

From filtrates of *Bact. coli*, the active substances were precipitated by 3 per cent. acetic acid, separated by centrifuging, redissolved by a few drops of 5 per cent. Na_2CO_3 and taken up in physiological saline to one-tenth of the volume of the original filtrate. The solution had a similar effect to the original filtrate. Injected in sufficient doses, these bacillary products produced a haemorrhagic reaction even in control guinea pigs, but the BCG-vaccinated animals were much more sensitive than the controls.

This " non-specific allergy " manifested itself also by an extremely acute local reaction to the intradermal or subcutaneous injection of *Bact. coli* products ; *e.g.*, the intracutaneous injection of a tuberculous guinea pig with a suspension of killed *Bact. coli* produced a haemorrhagic area at the site of injection followed later by sloughing and scar formation. No such result was obtained with normal guinea pigs. Also, if tuberculous guinea pigs with scars of former cutaneous

reaction to tuberculin were given a fatal dose of *coli*-toxin, they developed in about two hours an acute congestion at the sites of those scars.

The agglutinating power of guinea pig serum for *Bact. coli* was studied, but was found to be as great in healthy as in tuberculous animals. Also, the injection of *Bact. coli* suspensions previous to BCG vaccination had no effect on the haemorrhagic reaction evoked by the injection of a similar suspension ten days after vaccination.

Guinea pigs infected with pseudotuberculosis and injected intradermally with suspensions of *Bact. coli* or *P. vulgaris* responded like tuberculous animals by an intense haemorrhagic reaction tending to necrosis and scar formation. A general hypersensitiveness was also evinced by pseudotuberculous guinea pigs.

Guinea pigs injected with dead tubercle bacilli showed a general hypersensitivity to the *coli*-toxin in a similar manner to those vaccinated with BCG. Dead BCG vaccine did not confer this hypersensitivity even when injected in large doses. Dead *Pasteurella pseudotuberculosis* acted similarly to dead *Mycobact. tuberculosis*, but the effect was not so lasting. Only in animals injected with living organisms did the author observe a cutaneous sensitiveness, demonstrated by a haemorrhagic reaction to an intradermal injection of *Bact. coli*.

By using a pathogenic fungus (*Oidium albicans*), the injection of which caused thickening of the peritoneum with caseous nodule formation, the author was able to produce a hypersensitivity with similar characters to that produced by the injection of dead tubercle bacilli. A similar hypersensitivity was evoked by the peritoneal injection of thick suspensions of sterile powdered chalk, which caused inflammation and nodule formation on the peritoneum.

The author concludes that it is the inflammatory reaction which is important in this " non-specific allergy ". The cutaneous reaction is not, however, shown in the absence of an infection. He thinks, therefore, that the cutaneous reaction may depend upon a diffuse impregnation of the animal tissues with products from the lesions, an impregnation which the injection of dead micro-organisms is not able to produce.—A. Robertson.

Ahlström, C. G. (1936). **Experimental Investigation of the Allergic Tissue Reaction of the Kidneys.**—*Acta path. microbiol. scand.* Suppl. 26. pp. 224-227. [In English].

A report of a series of experiments to determine the allergic tissue reaction of the kidneys. [The type of experimental animal used is not recorded]. Experiments were carried out with horse serum and also with Dick toxin (toxin of scarlet fever streptococcus). After sensitization by subcutaneous injection, reinjections were made direct into the renal artery. With Dick toxin it was only possible to elicit scanty focal glomerular and parenchymal changes and similar changes were elicited in non-sensitized animals. With horse serum renal changes of varying types were obtained, the glomerular changes being very similar to those seen in diffuse glomerulo-nephritis. By means of the previous injection of staphylolysin the sensitivity of the animals was increased and their power of resistance against an allergic effect lowered. In numerous cases extensive necroses were found in the acini of the liver and occasionally a focal myocarditis was recorded.—A. R.

I. Sédallian, P., & Clavel, C. (1935). La fixation des anticorps microbiens sur les bactéries et leur éluage. Technique de la récupération des agglutinines. Application à l'étude des antigènes microbiens. [**The Fixation of Agglutinins to Bacterial Bodies and their Subsequent Elution**].—*Rev. Immunol.* **1.** 240-268. 21 tables. [Numerous refs.]

II. Meyer, K., & Pic, A. (1936). De l'isolement des anticorps par fixation à

une système adsorbant-antigène et dissociation consécutive. **[The Isolation of Antibodies by Fixation to an Antigen followed by Elution]**.—*Ann. Inst. Pasteur.* **56.** 401-412. 11 tables. [2 refs.]

III. LANDSTEINER, K., & VAN DER SCHEER, J. (1936). **On Cross Reactions of Immune Sera to Azoproteins.**—*J. exp. Med.* **63.** 325-339. 11 tables. [12 refs.]

IV. EAGLE, H., SMITH, Dorothea E., & VICKERS, P. (1936). **The Effect of Combination with Diazo Compounds on the Immunological Reactivity of Antibodies.**—*Ibid.* 617-643. 8 tables, 3 graphs. [Numerous refs.]

I. The experiments reported in this article were based on the application of monovalent sera to washed suspensions of the corresponding bacteria followed by separation of the agglutinins by elution. The maximum recuperation of the agglutinins, fixed to the bacteria in this manner, occurred in the zone of saturation, *i.e.*, when the proportions of bacterial bodies and immune sera were such that after centrifugation no agglutinins were detectable in the supernatant fluid. The antibodies were liberated by HCl at a pH of 1·4 to 1·7 or by a concentrated solution of saccharose.

II. The authors describe a method of preparing pure solutions of antibodies with special reference to the antigen and antibody of the tubercle bacillus. The antigen was first adsorbed on to suitable amounts of kaolin. When this antigen-kaolin complex was added to the antiserum, about 80 per cent. of the specific antibody was adsorbed. The latter was subsequently liberated by heating the mixture to 60°C. and removing the kaolin by centrifuging the suspension while hot. It is claimed that by this method pure solutions of antibodies can be isolated from mixtures.

III. With natural antigens, the overlapping reactions in serological tests are usually ascribed to multiple antibodies resulting from several substances or specific groups in the immunizing antigen. In these experiments, precipitins were prepared against artificially conjugated antigens in which the chemical constituents of the reacting groups were known. The results showed that the sera contained not only a homologous antibody, but also fractions which reacted in a somewhat different manner with heterologous antigens. It is suggested that the separation from an immune serum of antibody fractions which differ in specificity is no proof of the existence of several groups in the immunizing antigen.

IV. In this paper, an attempt was made to study the effects of various diazo compounds on the reactions of antibodies with the object of identifying their chemical affinities. Various antisera such as horse antipneumococcus serum and refined globulin, diphtheria antitoxin, etc., were coupled with diazo compounds by a method which permitted the taking of aliquot samples. It was found that every antibody studied lost all reactivity with the corresponding antigen on sufficient linking with the diazo compound. The results of the experiments suggest that each molecule combines with progressively increasing quantities of diazo compound and thereby gradually loses its immunological activity. The effects were largely independent of the type of substance added.—R. E. GLOVER.

—. (1936). Taux d'agglutination et tuberculination. **[Effect of the Tuberculin Test on the Accuracy of Agglutination Tests for *Brucella abortus* Infection]**. —*Bull. Off. vét., Berne.* **37.** 48.

—. (1936). Agglutinintiter und Tuberkulinprobe. **[Effect of the Tuberculin Test on the Agglutination Titre for *Br. abortus*]**.—*Schweiz. Arch. Tierheilk.* **78.** 137.

Tests on numerous cattle showed that tuberculin tests or temperature reactions consequent on tuberculin tests have no influence on the titre of the animals' blood in agglutinins for *Br. abortus*, whether the titre signifies infection or not.—J. E.

CRUICKSHANK, J. C. (1936). **Modern Methods in Agglutination.**—*Proc. R. Soc. Med.* **29.** 841-854. 4 tables.

The agglutination reaction may be used for the identification of an organism, or to determine the antibody content of a patient's serum as a means of diagnosis. There are many methods – microscopic, slide, and macroscopic; the author describes the latter method in some detail, stressing the value of the standardization of technique. Standardization also includes the accurate dilution of serum and the use of standard bacterial suspensions.

There follows a description of the changes in the agglutination reaction as now carried out due to our knowledge of the complex antigenic structure of some species of bacteria. The salmonella group is taken as an example and attention is focussed on " H " and " O " antigens, phase variation, the sharing of antigenic factors by members of the group, and rough and smooth variation.

The practical application of this knowledge is discussed, especially from the point of view of the diagnosis of human enteric fever, by the identification of an unknown member of the salmonella group and also by testing the patient's serum. In the latter case, it is important to consider the significance of " O " agglutinins, the level of agglutinins for the enteric group in the normal population, the response to protective inoculation with enteric vaccines, and the rise and fall of agglutinins during and after infection. All these points are considered when dealing with the interpretation of the test. A brief reference is made to the " Vi " antigen described by FELIX.

A very brief outline is also given of the antigenic structure of the dysentery group of bacteria and mention is made of the use of the agglutination test for diagnostic purposes. A few of the major points concerning the cholera group of vibrios and the brucella group are also dealt with.

The article, which forms the substance of an address, is a brief but excellent discussion of the recent developments in the methods of carrying out the agglutination reaction, the value of the additional information which may be acquired by these methods and the way in which that information may be interpreted.

—R. LOVELL.

CANNON, P. R. (1936). **Some Recent Trends in the Study of the Mechanisms of Immunity.**—*J. Amer. vet. med. Ass.* **88.** 225-233.

This is an inaugural address read at a livestock sanitary congress. The author first reviews the problem of immunity generally and the lines upon which an understanding of the subject has developed. He then proceeds to discuss some modern tendencies in the study of the immunity phenomenon. The following are specially considered :– the part played by the liver and spleen in the elimination of micro-organisms from the body; the role of the capillary endothelium and its permeability, and inflammation and the barrier it affords to the invasive action of bacteria imprisoned within its area. The paper contains no new material.

—C. DAVENPORT.

WIRTH, D. (1936). Tiermedizin. [**Red Blood Cell Sedimentation in Veterinary Medicine**].—*Blutkörperchensenkung.* [Edited by REICHEL, H.] pp. 231-236. 1 table. [Numerous refs.] Vienna: Julius Springer.

The above comprises a chapter in a text-book on blood cell sedimentation, edited by Dr Hans REICHEL. Wirth gives a review, with a bibliography, of the veterinary literature.

The sedimentation rate is faster in horses than in cattle.

The clinical use of the R.B.C. sedimentation test is practically limited to the diagnosis of anaemia in horses, the method being one of the group of tests of value in the diagnosis of the virus disease – equine infectious anaemia.—J. E.

DISEASES, GENERAL.

I. VOLTRI, L. (1935). Hygienische Faktoren in der Bekämpfung der Ferkelkrankheiten. [**Hygienic Control of Piglet Diseases**].—*Balti Riikide II VetPäevluse Ref.* pp. 57-69. 2 figs. [In German].

II. SNIECKIENE, P. (1935). K voprosu o boleznjach porosjat v Litve. [**Diseases of Piglets in Lithuania**].—*Ibid.* pp. 70-87. 2 tables, 3 charts. [Numerous refs.] [Abst. from German summary].

I. A general article on practical pig-keeping with reference to adequate nutrition and dietetics, warmed air ventilation for pigsties and materials for the construction of warm floors.

II. The Lithuanian government first investigated diseases of swine in 1929; the most important ones are described here. Swine fever quickly spread a few years ago, but its incidence has been reduced recently. The most important disease at present is a hepatitis, which occurs in piglets which are kept indoors and fed on the same food as that given to grown pigs. They often die overnight; the characteristic lesion found is a toxaemic hepatitis. No evidence of a specific infection is found.

Enzootic pneumonia is also common and appears to be caused by bad hygiene. Other common diseases include gastro-enteritis due to improper feeding, diarrhoea of sucklings, parasitic infestation, swine fever and swine erysipelas.

In the discussion certain speakers referred to methods of making pigsties warm and damp-proof – a factor of great importance in north European countries.

Resolutions concerning improvement in the diet of piglets and in pigsty construction were passed.—J. E.

GORDON, H. McL. (1936). **Some Field Observations on Various Diseases of Sheep.**—*Aust. vet. J.* **12.** 28-31. [2 refs.]

This article comprises a brief discussion based on field observations of the following conditions :– intussusception associated with infestation by *Oesophagostomum columbianum*, a case of necrotic abomasitis, poisoning by rock fern (*Cheilanthus ternifolia*), " staggers " associated with ingestion of marsh mallow (*Malva* spp.), infestation with *Nematodirus* spp., *Cooperia* spp. and *Paramphistomum* spp., and brittle bones associated with dietetic conditions.

I. ROLLE, M. (1935). Geflügelkrankheiten in Lettland. [**Fowl Diseases in Latvia**].—*Balti Riikide II VetPäevluse Ref.* pp. 52-56. [In German].

II. TALTS, H. (1935). Daten über die verbreitetsten Geflügelkrankheiten und deren Bekämpfung in Estland. [**Poultry Diseases in Esthonia**].—*Balti Riikide II VetPäevluse Protokoll.* pp. 52-55. [In German].

III. SNIECKIENE, P. (1935). Bolezni domasnich ptic v Litve. [**Poultry Diseases in Lithuania**].—*Ibid.* pp. 56-59. 1 table. [In Russian : abst. from German summary].

I. In Latvia, as in the other European countries of the same latitude, nutritional diseases are of more importance than infectious diseases. Thus avitaminoses, chiefly avitaminosis A, were the cause of 30 per cent. of diseases diagnosed by the author between 1929 and 1935. Inflammation of the oviduct, various poisonings, coccidiosis, intestinal parasites, tuberculosis, lymphadenosis [leucosis ?] and neoplasms follow in this order. *Salmonella pullorum* infection has not been diagnosed since 1933. Tuberculosis is the most wide-spread infectious disease. Rolle states that he found bovine tuberculin useful for diagnosis of tuberculosis in fowls. The most common helminth parasites are *Ascaridia lineata*, *Heterakis gallinae*, *Capillaria* spp. and tapeworms.

II. The intensification of poultry-keeping in Estonia between 1925 and 1929 led to a spread of infectious diseases of poultry. Between 1930 and 1935 tuberculosis was the most wide-spread disease, being present in 39 per cent. of breeding areas : it has been controlled to a large extent by tuberculin testing and slaughter of infected birds.

Coccidiosis comes next in importance, but has lately been reduced to a few districts. *S. pullorum* infection is said to have been eradicated, though five years ago it was wide-spread and a cause of great loss.

Eggs for incubation and imported birds are now subjected to veterinary control by the use of appropriate bacteriological tests on the birds and on the eggs.

III. A table is given to show the incidence of the 23 chief diseases observed in Lithuania between 1929 and 1935 ; tuberculosis is the most important, being observed in 12 per cent. of all dead birds examined. Coccidiosis and *S. pullorum* infection do not cause great loss.

A resolution was passed calling attention to the fact that tuberculosis is the most serious infective poultry disease of the Baltic States and that coccidiosis of chicks and helminth parasites of adult fowls come next in importance.—J. E.

KRAPIVNER, L. M. (1935). K voprosu organizacii protivoepizootičeskich meropri-jatii v pticechozjaistvach. [**The Control of Poultry Diseases in the U.S.S.R. Fowl Pox**].—*Sovyet. Vet.* No. 3. pp. 20-24.

The author obtained good results in the immunization of fowls against fowl pox by the use of virus passed through pigeons.

GEAR, H. S., & PEDERSEN, H. (1935). **Some Diseases Common to Man and Animals in China.**—*Trans. Far-East. Ass. trop. Med. 1934.* **2.** 305-323. [Numerous refs.]

The object of this paper is to supply a concise account of present-day conditions in China in regard to medical and veterinary public health problems. By way of introduction the authors review the place occupied by animals in the domestic economy of the Chinese. They show that, although animal products play a very small part in the diet of the people, the number of farm animals in the country is nevertheless considerable, pigs alone totalling 94 million. No general veterinary service exists. The establishment of foreign communities within the country has, however, led to a demand for milk and meat and, in consequence, municipal veterinary services are being created in the larger cities. The author describes the existing state of affairs in China in regard to certain diseases of both medical and veterinary importance. The diseases mentioned are actinomycosis, anthrax, foot and mouth disease, glanders, certain helminthic conditions (notably fluke and taenia infestations), human plague [pasteurella infection], psittacosis, rabies, rat-bite fever, tuberculosis, undulant fever and bovine contagious abortion. A certain amount of statistical information is given in regard to each.—C. DAVENPORT.

HOFFERD, R. M. (1936). **Swine Dysentery in Iowa from a Field Standpoint.**—*J. Amer. vet. med. Ass.* **88.** 299-310.

Swine dysentery has lately become an important disease in Iowa, over which it has spread. The death rate varies greatly and is often 50 per cent. Pigs of all ages are susceptible, and animals immunized against swine fever a short time previously are often affected. The cause has not been found, but it is a fact that transmission can be effected by the ingestion of the intestinal tissue of affected pigs, and by exposure in infected pens. The incubation period apparently varies between two and seven days. There is at first a dark diarrhoea, which passes into dysentery accompanied by moderate fever (104·6°F.). Death may occur in two to seven

days. Dead pigs show a haemorrhagic enteritis in acute cases, and a diphtheritic membrane formation in more chronic cases. Inflammation may extend to the kidneys, spleen and bladder and pneumonia may occur secondarily.

Diagnosis is fairly easy while dysentery is present, but confusion with swine fever may occur.

Hygienic measures are indicated for control.—J. E.

HERMANN, A. A. (1936). **Canine Typhus – an Anemia of Dogs.**—*J. Amer. vet. med. Ass.* **88.** 706-708.

A clinical description of what is called in the United States of America canine typhus, otherwise known as blacktongue. For curative purposes the author recommends yeast in various forms, and raw calf liver as soon as the dog can retain it [see also this *Bull.* **5.** 518, and **6.** 164].—J. E.

SUBOTNIK, A. S. (1936). K etiologii irido-ciklo-chorioiditov losadej (tak nazivaemoj periodičeskoj oftalmii losadej i schodnich s nej zabolevanij). [**The Aetiology of Irido-Cyclo-Choroiditis in Horses (Periodic Ophthalmia)**].—*Sovyet. Vet.* No. 3. pp. 84-89.

A bacteria-free filtrate of the ground eyeball of a horse affected with periodic ophthalmia proved non-pathogenic to rabbits and guinea pigs on injection into the vitreous humour of the eye, but when similarly injected into horses it produced symptoms of periodic ophthalmia. The author was led by his experiments and by his observation of the natural form of the disease to the following conclusions :– there are two kinds of periodic ophthalmia, transmissible and non-transmissible. The transmissible variety is confined to horses. It is transmitted by a virus, non-culturable on artificial media and non-toxic on subcutaneous or intradermal inoculation of rabbits or guinea pigs. It cannot be observed microscopically in smears from the vitreous humour of the eye and does not produce allergic reactions.

The author urges the necessity of research with a view to finding a method of inoculation more similar to the natural method than the ophthalmic mode which he used, and to differentiating the two types of the disease.

LANGE, H. (1935). Ueber eine " Kreuzlähme " bei Schweinen. [**A Paraplegia of Swine**].—*Dtsch. tierärztl. Wschr.* **43.** 753-754. 1 fig. [4 refs.]

An outbreak of paraplegia in swine in the neighbourhood of Leipzig is described. The animals, about 1 cwt. in weight, normally permitted to roam about the premises, were confined to a pen for a week. They subsequently developed paraplegia. Some were so badly affected that they had to be slaughtered, but others recovered. Recovery was more rapid when their food, consisting of barley meal and soya bean meal, with a little cod-liver oil, was changed.

Lameness was the only clinical symptom but, on *post-mortem* examination, the muscles of the limbs were very pale and showed petechiae, the heart being likewise affected. Histological examination revealed varying degrees of degeneration with loss of the normal striation. The cause of the condition was not ascertained but the author suggests an auto-intoxication or an obscure form of food poisoning.

—N. S. BARRON.

AMMANN, K. (1936). Ueber spinale Lähmungen des Pferdes und Rindes. [**Spinal Paralysis in Horses and Cattle**].—*Arch. wiss. prakt. Tierheilk.* **70.** 175-199. 9 figs. [Numerous refs.]

The author gives 16 detailed case records of horses and cattle which showed paralysis or paraplegia before death and were killed as incurable. The work is a discussion on the aetiology of spinal paralysis as illustrated by these cases : it is

not suitable for abstraction as a whole in general terms ; it is an important article and must be read in the original to be properly appreciated.—J. E.

OPPERMANN, M. (1935). Untersuchungen des Zirkulationsapparates bei Kehlkopfpfeifern. [**The Circulatory System in Roaring Horses**].—*Inaug. Diss., Hanover.* pp. 62. 6 tables, 1 chart. [Numerous refs.]

After a long review (32 pp.) of the literature on roaring, the author describes his observations on 45 roarers. He investigated the blood picture, the pulse and the serum albumin content, using the sublimate test, and classifies his results in a series of tables, including also 50 further cases recorded in the archives of the Medical Clinic of Hanover Veterinary College.

Some 77 per cent. of the 95 roarers were males, 40 per cent. were " kaltblut " and 60 per cent. " warmblut " (thorough-bred). The ages of the roarers were mostly between four and ten years. 15 per cent. had a normal pulse and blood picture, 20 per cent. had disordered heart actions but a normal blood picture, 11 per cent. showed abnormal blood picture alone, and 36 per cent. had abnormal pulse and blood picture. No evidence of the existence of a hereditary factor in the causation of roaring was found and it appears likely that the degeneration of the left recurrent nerve is due to trauma at its aortic bend, secondary to tumultuous heart action in horses put to severe training early in life.

[Recent important work on this subject by BALLANCE, by ARGYLE, and by GLYN LLOYD has not been noticed – see this *Bull.* **5.** 284, 441 and 513].—J. E.

WIRTH, D. (1936). Thrombopenische Purpura beim Hund. [**Thrombopenic Purpura in the Dog**].—*Wien. tierärztl. Mschr.* **23.** 353-359. 2 figs. [6 refs.]

A record of three cases of purpura haemorrhagica in dogs, accompanied in each case by a diminution in blood platelets. The normal range for platelets is given as from 200,000 to 600,000 per c.mm. In the first case described, the platelet count was 7,700 and in the other two cases they were almost completely absent. In the first animal, administration of iron and calcium restored the erythrocyte and platelet counts almost to normal, but death finally resulted from anaemia 15 months later. The other animals also failed to recover, one dying of streptococcal sepsis and the other of haemorrhagic gastro-enteritis.—E. G. WHITE.

SALAH, M. (1935). **Studies on Anaemia in Egypt. I. Methods of Investigation. II. Helminthic Anaemias. III. Treatment and Mechanism of Helminthic Anaemia. IV. Rarity of Addisonian Anaemia in Egyptians.**—*J. Egypt. med. Ass.* **18.** 425-437, 438-454, 455-472 and 473-482. 2 figs., 1 table. [Numerous refs.]

Salah discusses, in a course of four lectures, anaemia and its association with nutrition and helminth infections in human beings in Egypt. In discussing the possible association with helminth infestation, he emphasizes the difficulty in the determination of any causal relationship and points out that a thorough clinical, biochemical and haematological study of the cases is required before anaemia due to helminth infestation can be diagnosed. He considers that, although the loss of blood and, possibly, the production of toxins, are contributing factors in the production of such anaemias, the essential part of the mechanism is a nutritional deficiency, mainly of iron. [Hookworm anaemia is known to respond to iron therapy even more quickly than to anthelmintic treatment, and it is probable that the deficiency of iron in most cases is largely a result, and not a cause, of the worm infestation]. Accordingly, treatment should be directed to the administration of large doses of iron, supplemented by fats and proteins to help in the construction of the haemoglobin molecule.—E. L. TAYLOR.

BRENZENS. (1935). Zur Sterilitätsfrage der Haustiere in Lettland. **[Sterility of Domestic Animals in Latvia]**.—*Balti Riikide II. VetPäevluse Ref.* Suppl. pp. 11. [In German].

Owing to the comparatively more natural conditions of life and to the smaller incidence of *Brucella abortus* infection in Latvian cattle compared with the incidence in other European countries, sterility is of limited importance and is usually due to anoestrus or to failure in conception, both influenced by nutritional and climatic conditions. Infection of the genital tract with *Corynebact. pyogenes* accounts for nearly one-third of all cases and nymphomania is very common in certain districts at irregular times.

The results of horse-breeding at government studs are good, the fertility percentage of all matings being from 70 to 80 per cent. Abortion due to paratyphoid infection and mastitis caused by streptococci were observed at one stud.

Veterinary surgeons from Latvia, Lithuania and Sweden contributed to the discussion and a resolution was passed drawing attention to the necessity for holding post-graduate courses of instruction in sterility and for publishing instructional articles for farmers on the subject.—J. E.

BAYLY, A., HANKIN, T. H., & HAUGH, P. (1936). **Eversion of the Vagina in Ewes.**—*N.Z.J. Agric.* **53.** 19-27.

The authors have summarized their preliminary field investigations in several districts of the North Island of New Zealand for the previous year, giving the incidence of disease, type of ewe affected, number of lambs *in utero*, *post-mortem* examination, preventive measures and treatment. No new ideas were put forward as to the aetiology of this disease.—C. S. M. HOPKIRK.

PONOMARENKO, F. M., DIESPEROV, A. G., & GOROVY, U. N. (1936). Materiali po ikterogemoglobinurii u teljat na Ukraine. **[Icterohaemoglobinuria in Calves in the Ukraine]**.—*Sovyet. Vet.* No. 5. pp. 11-15.

Cases occurred in 1933, 1934 and 1935 in the Ukraine of a disease of calves, unknown up to that time to Russian veterinarians. Young stock (calves, 1 to 7 months old) were affected. The disease prevailed between May and August. The calves usually fell ill when out at pasture. Recoveries mostly took place when the affected calves were removed from pasture on the appearance of the first symptoms and placed in sheds, their feed being correspondingly changed. The symptoms were diarrhoea followed by constipation, blood in the urine (not always at first), rise in temperature (40° to 42°C.), until the appearance of blood in the urine. The breathing and pulse were more or less normal. Tympanites, grinding of the teeth, drowsiness and indifference to surroundings were common. The appetite was not generally affected. Conjunctivitis occurred in some cases. Paralysis of the neck and hind legs was occasionally noted. Fatal cases lasted 3 to 4 days, mild cases 4 to 6 days. Parenchymatous hepatitis, glomerulo-nephritis and swelling of the spleen occurred.

The authors were unable to establish the spirochaetal nature of the disease by bacteriological or histological observation, but in view of its likeness in certain respects to cases which occurred in the North Caucasus region, and which were found to have a spirochaetal origin, they think that the possibility cannot be dismissed.

PULLAR, E. M. (1936). **An Account of an Outbreak of a Disease of Swine Associated with Icterus and Acute Hepatitis.**—*Aust. vet. J.* **12.** 20-25. 1 fig. [6 refs.]

Out of nine three-month-old pigs, five died showing unusual symptoms and

lesions. Two of them were subjected to detailed examination. Symptoms were pyrexia, abdominal distention and jaundice. On *post-mortem* examination both showed icterus and oedema of all muscles, fat and connective tissue. There were petechiae in the lungs and heart, and the peritoneum contained about 1,500 ml. of bile and blood-stained fluid. The liver was enlarged to two or three times the normal size and presented a variegated appearance owing to intralobular necrosis and petechial haemorrhages. The spleen was also enlarged. Sections of the liver showed oedema of the interlobular connective tissue and a varying degree of cloudy swelling and necrosis of the hepatic cells, in some lobules all the liver cells being necrotic. *Salmonella cholerae-suis* was isolated from the liver, spleen and heart blood.

Inoculation of the peritoneal exudate did not set up the condition in other pigs. Cultures of the organism were pathogenic for pigs but did not reproduce the same symptoms and lesions. The author considers that he was dealing with two concurrent diseases – *S. cholerae-suis* septicaemia and ideopathic haemorrhagic hepatitis as described by QUIN and SHOEMAN [this *Bull.* **4.** 379].

—W. I. B. BEVERIDGE.

BAUMGÄRTNER, H. (1936). Histologisch feststellbare Lymphadenose der Skelettmuskulatur des Rindes. [**Lymphadenosis of the Skeletal Muscles of Cattle**]. —*Z. Fleisch- u. Milchhyg.* **46.** 169-171. [3 refs.]

The author, from an examination of material from 11 cases of lymphadenosis, found that swelling of the spleen was the most striking lesion, leading in two cases to rupture during life. In some cases the muscle lymph glands showed advanced changes, but on gross inspection the muscle tissue of only one case appeared abnormal. On microscopic examination, the muscle tissue of five cases showed changes characteristic of the disease. The muscle tissue in this disease does not become involved along with the lymph nodes; the author is investigating the causes of this.—J. E.

I. MILKS, H. J., & OLAFSON, P. (1936). **Primary Brain Tumors in Small Animals.**—*Cornell Vet.* **26.** 159-170. 6 figs.

II. GULDBERG, G. (1936). **Experiments in Cultivation of Melanotic Tumours.** —*Acta path. microbiol. scand.* Suppl. 26. pp. 98-110. 5 figs. [2 refs.] [In English].

I. A record of 11 tumours of the central nervous system (10 in dogs and one in a cat). A brief account of the history and clinical symptoms is given; the histological structure of the neoplasms is to form the subject of a later paper. The tumours are classified as gliomas (5 cases in dogs, one case in a cat), perithelial sarcomas (4 cases in dogs) and a carcinoma (in a bitch, secondary to mammary carcinoma).

II. This paper deals with attempts to cultivate *in vitro* melanotic tumours from a horse and mice. At the time of commencing the experiment there existed no record of the cultivation of melanotic tumours, but this has since been reported by other workers.

The first attempt was made using a melanosarcoma obtained from the anal region of a grey horse and a metastasis in the mediastinum. All attempts at cultivation, using a variety of media and both cover-slip and Carrel flask cultures, were unsuccessful. The use of similar methods with a slow-growing melanoma occurring in mice resulted, in the case of cover-slip cultures, in slight growth for a few days. Following a latent period of from 48 to 72 hours growth was much more successful in Carrel flasks. Pigment was observed both intra- and extracellularly, but no evidence could be obtained as to whether it was actually formed in

the cells or whether it represented pigment derived from the implant and carried through the cultures. Cultivation will have to be carried on for much longer periods in order to decide this point: if no new pigment is formed the amount within the cells will progressively decrease.—E. G. WHITE.

CARRÉ, H. (1936). Sur l'entérite des agneaux provoquée par la suralimentation. **[Enteritis in Lambs caused by Overfeeding].**—*Rec. Méd. vét.* **112.** 321-333. 2 figs.

A detailed description of a disease causing death in lambs, usually three to four months old, which are being fattened as quickly as possible for the meat market.

Lambs are usually found dead, but it is sometimes possible to observe them when affected with partial paraplegia before death. Voluminous faeces coated with greyish-yellow mucus are said to be a constant premonitory symptom, which may give a timely warning to the owner.

Lambs newly dead show intestines nearly empty of food, but full of gas, the rumen is overdeveloped for the animal's age and full of food matter, and the kidneys are soft and pulpy. There are no signs of acute bacterial infection.

The author considers that a condition of paresis of the gastro-intestinal tract is caused by overfeeding, especially if fermentable beetroot and much linseed cake are given. He suggests that this provides a favourable condition for the development of anaerobic bacteria in the intestine, and that death is actually caused by enterotoxaemia.

Lambs can usually be saved if beetroot and/or linseed cake are stopped.

[No appropriate research for enterotoxaemia was carried out].—J. E.

I. LANDAUER, W. (1935). **Studies on the Creeper Fowl, IX. Malformations Occurring in the Creeper Stock.**—*J. Genet.* **30.** 303-320. 18 figs. on 3 plates. [Numerous refs.] [For abst. of previous article of this series, see this *Bull.* **5.** 590].

II. FELL, H. B., & LANDAUER, W. (1935). **Experiments on Skeletal Growth and Development *in vitro* in Relation to the Problem of Avian Phokomelia.**—*Proc. roy. Soc. Ser. B.* **118.** 133-154. 2 text figs., 18 figs. on 2 plates. [12 refs.]

III. LANDAUER, W. (1936). **Micromelia of Chicken Embryos and Newly Hatched Chicks Caused by a Nutritional Deficiency.**—*Anat. Rec.* **64.** Suppl. No. 2. 267-276. 5 figs., 1 table. [5 refs.]

I. The malformations occurred in heterozygous " creeper " and in genetically normal embryos segregating from " creeper " crosses. Breeding data show that the malformations were not due to the " creeper " mutation itself, or to a recessive gene linked with it, or to non-genetic agencies acting on the eggs of the " creeper " hens. Suggestions are made as to possible causes.

II. Leg-buds were explanted into normal and growth-restricting media. The smaller the explant the greater the restriction in ossification. Larger explants ossified normally. Small membrane bone explants developed normally. It is concluded that conditions which restrict growth and ossification in limb bones do not necessarily prevent membranous ossification. The abnormalities of the phokomelic homozygous " creeper " embryos are the result of a non-specific growth-retarding effect of the creeper mutational difference at an early stage of development.

III. This article is a histological and morphological study of changes occurring in wing and long bones. The prenatal nutritional deficiency results in a disproportionate stunting of the extremities. Membrane bones are unaffected. Changes in growing cartilage are slight. The condition is not unlike mammalian scurvy and osteogenesis imperfecta.—HENRY DRYERRE.

MELLANBY, E. (1936). **Report on Research Work on Cancer, Carried out at the Field Laboratory, University of Sheffield, 1934-1935.**—*Vet. J.* **92.** 152-156.

Various experiments to determine the possible interconnexion between tar tumours and the Rous sarcoma in fowls are described. When a filtrate of a dibenzanthracene tumour from a fowl carrying simultaneously the Rous sarcoma was injected into test birds, a Rous sarcoma was produced and not a dibenzanthracene tumour ; this may suggest that the filtrable agent of the Rous sarcoma passed into the tar tumour.

The lethal action of potassium permanganate on cancerous tissue and cancerous filtrable agents was also studied. The concentrations used were insufficient to sterilize, but strong enough to inhibit, the growth. Different tumours have different resistance to $KMnO_3$, the Rous sarcoma being most resistant. Preliminary work on the action of snake venom on cancerous growth is also recorded.—J. E.

I. VON EULER, H., & MALMBERG, M. (1935). Keratinisierung der Epithelschleimhäute bei Vitamin A- und Carotinmangel ; Antiinfektionswirkung A. [**Keratinization of Epithelial Mucous Membranes in Vitamin A and Carotene Deficiency ; the Anti-Infective Action of Vitamin A**].—*Hoppe-Seyl. Z.* **232.** 1-5. [Numerous refs.]

II. GRAHAM, R., MITCHELL, H. H., & MITCHELL, Viola M. (1936). **Avitaminosis in Animals.**—*Circ. Ill. agric. Exp. Sta.* No. 449. pp. 15. 6 figs. [5 refs.]

III. COWELL, S. J. (1936). **Vitamins. Developments during the Years 1934-5.** —*Bull. Hyg., Lond.* **11.** 255-268. [Numerous refs.]

IV. HOGAN, A. G., & RICHARDSON, L. R. (1936). **Differentiation of the Anti-Dermatitis Factor.**—*Science.* **83.** 17-18. 1 fig. [4 refs.]

I. Of 15 recently weaned white mice on a ration deficient in vitamin A, 12 succumbed within 50 days without showing keratinization of epithelial mucous membranes.

In an epidemic infection with " *Bacterium haemosepticum* " (rat pasteurellosis) occurring in laboratory rats, the only animals affected were those on vitamin A-deficient diets. The resistance of the rats receiving vitamin supplement could not be correlated with higher antibody formation.

II. A short general description of the vitamins is given together with a summary of the recognized diseases and symptoms resulting from a deficiency of the specific vitamin.

Notes on prevention and treatment are also given.

III. A short review giving recent advances in the knowledge of the chemistry and functions of vitamin A, the vitamin B complex which includes B1, B2 and B6, and vitamins C and D.

IV. Experiments on rats showed that dermatitis produced by feeding a basal ration deficient in all members of the vitamin B complex, supplemented by a vitamin B carrier exposed to ultra-violet irradiation, was healed by the addition of wheat-germ oil and also by the addition of illuminated vitamin B carriers such as a water extract of yeast, but for normal growth addition of flavines was necessary. Flavines alone had no effect on the dermatitis.

The rats became denuded on tikitiki (rice polishings) but new hair grew after addition of flavines. Wheat-germ oil had no effect on denuding.—R. ALLCROFT.

LONGWELL, J. H., & WEAKLEY, C. E., Jr. (1933). **Some Observations on Pigs receiving Vitamin A Deficient Rations.**—*Proc. Amer. Soc. anim. Prod. 1932.* pp. 169-173. 3 tables.

Groups of pigs fed on a ration of white maize, middlings, tankage and minerals,

and of white maize, oats, linseed oil meal, tankage and minerals, developed a serious condition of the eyes affecting the iris and cornea, and paralysis of the hind quarters with laboured breathing and convulsions, whereas those receiving yellow maize and alfalfa meal [vitamin A supplements] attained slaughtering weight more rapidly and economically without any of these symptoms. Mineral analysis of the bones revealed no significant differences between normal and affected pigs nor were there any indications of vitamin D deficiency.—ALFRED EDEN.

DUNLOP, G. (1934). **Paralysis and Avitaminosis A in Swine.**—*J. agric. Sci.* **24.** 435-456. 2 figs., 4 tables. [Numerous refs.]

In a randomized experiment to test the effect of mineral and vitamin D supplements upon the utilization of food consumed by pigs between weaning and attainment to a sufficient weight to be killed for bacon, three groups of animals which had received a small daily dose of liver, just before or just after weaning, grew normally to bacon weight. Those in a fourth group, in the ration of which liver was omitted, although they received the mineral supplement, lost their appetites eight to ten weeks after weaning and developed a condition referred to as staggers or " off their feet ", which was characterized by lack of co-ordination of muscular movement, with loss of control over the hind quarters and ultimately of the fore limbs. Analysis of the bones and determination of calcium, inorganic phosphorus, haemoglobin and phosphatase in the blood and of red corpuscle counts showed no significant differences from normal.

Vitamin therapy with carotene, cod liver oil and orange juice effected a marked recovery, and normal appetite and growth were resumed within three weeks. " Blue value " determinations on the livers revealed an absence of vitamin A from the affected pigs and depletion of the reserves in normal groups, proportional to the growth rate. Standard basal rations are shown to be low in carotene [pro-vitamin A]. Storage in the livers occurred in proportion to the amount supplied in the supplement.

This paralysis has also been experimentally produced in other countries, [see previous abst. and also JESPERSEN, PJOERER & PETERSEN. (1932). *148 Beret. Forsogslab. Kgl. vet.-landbohojsk. Lab. Kbh.* p. 3]. The vitamin A requirement of pigs lies between 14 and 62 mg. carotene per 100 lb. food, but is supplied by green food under good practical husbandry conditions. A review of the literature relating to the condition is given.

[The principle of " blue value " determinations is as follows. The food or liver is dissolved in aqueous KOH with the aid of heat and then is extracted with ethyl alcohol and ether. The ethereal layer is taken off, washed with water, dehydrated and evaporated off on a water bath, and the residue is dissolved in chloroform. A blue colour is developed by antimony trichloride in chloroform and matched in a Lovibond tintometer. The method employed in the above paper was a modification of the older method – DAVIES, A. W. (1933). *Bio-chem. J.* **27.** 1770].—ALFRED EDEN.

PUBLIC HEALTH.

GREAT BRITAIN. (1936). **Ministry of Health. Sale of Milk under Special Designations.** pp. 16. London: H.M. Stat. Off. [3d.] [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 708. Signed W. G. SAVAGE].

A memorandum which sets out in general terms the provisions and the effect of the Milk (Special Designations) Order which operated from June 1st 1936. Some of the chief changes may be indicated. There are three grades of milk but

Tuberculin Tested milk may be labelled either *Tuberculin Tested Milk* (*Certified*) if bottled on the farm or *Tuberculin Tested Milk* (*Pasteurised*) if it is pasteurized. Grade A milk is abandoned, but a similar milk is now termed *Accredited Milk*. *Pasteurised Milk* remains as before. Licensing authorities can reduce or remit the fees. Tuberculin tested milk licences are now given by County or County Borough Councils and not as before by the Ministry of Health. The bacteriological standards are altered for both tuberculin tested and accredited milk in that after January 1st 1937 the milk for both must satisfy the prescribed methylene-blue reduction tests and must contain no coliform bacillus in 0·01 millilitre. For pasteurized milk there must now be on the apparatus both an indicating and a recording thermometer. The bacteriological standard is not more than 100,000 bacteria per millilitre any time before delivery to the consumer.

BARKER, J. B. (1936). **Veterinary Practice in Association with a Butter Factory [Australia].**—*Aust. vet. J.* **12.** 25-28.

Details are given of the organization of the veterinary services of a co-operative butter factory in the North Island of New Zealand. The object of the organization is to provide veterinary services to the company suppliers at a minimum cost. Routine tests of suppliers' cattle are carried out for *Brucella abortus* infection and mastitis, the necessary vaccines being made and serologic examinations conducted in the factory's pathological laboratory. Stock prescriptions and vaccines are available to suppliers at little more than cost price. In addition to the veterinarians' service, pamphlets are issued on treatment and prevention of disease. A nominal charge of 2/6d. is made for attendance on suppliers, irrespective of the distance travelled and the work done. The actual cost of the company's services over and above the small fees paid are borne by the suppliers as a whole, the necessary deductions being made from each supplier's monthly cream cheque. The cost of the services has decreased from 0·105d. per lb. butter fat supplied in 1923-1924 to 0·028d. per lb. butter fat in 1932-1933. Not only are the factory's suppliers now thoroughly convinced of the value of the service, but losses due to disease and bad husbandry have decreased markedly throughout the district.—I. CLUNIES ROSS.

TALENTI, M. (1935). Il controllo chimico della pastorizzazione bassa del latte. **[Chemical Control of Low-Pasteurized Milk].**—*Ann. Igiene* (*sper.*). **45.** 171-179. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 401. Signed H. H. S.]

SCHERN and GORLI proposed a method for distinguishing raw from heated milk, *viz.*, the power of the fat globules in the former to attract red corpuscles, coloured powders, etc. They mixed a suspension of the corpuscles, for example, with the milk and left it, and judged whether the milk had been heated or not according to the absence or presence of a coloured disc forming in the cream layer.

Subsequently others have modified this test, to find a suspension so adapted as to give a coloured disc in milks which had been subjected to a temperature of 66°C. or more for at least half an hour. The following is the composition of the preparation: Synthetic indigo 1 gm., casein 1 gm., water 100 cc. The casein is dissolved in a small quantity of decinormal soda and the water added; the indigo is ground in a mortar with some of the casein soda mixture, and the whole well mixed and filtered through cotton wool, finally 5 cc. of 5 per cent. phenol is added.

For the test 5 cc. of the milk is placed in a tube and 2 drops of the above suspension; the tube is shaken and left. The coloured disc appears (if at all) in a couple of hours; if heated in a water-bath at 30°C., the time is reduced to half an hour. If the milk sample is a mixture of pasteurized and raw milk, the result is positive if the proportion of raw milk is not less than 5 per cent. If the milk has been watered to a degree of 10 per cent. or more it behaves as if pasteurized.

It is necessary, therefore, before making the test to be certain that watering to this degree has not been done. It is not claimed that this test has the value of a bacteriological examination ; it is merely a rapid and handy test in practice to determine pasteurization or not.

DEBELIC, Š. (1936). Strani miris u mesu virus-svinja. [**Abnormal Odour and Taste in Flesh from Pigs Affected with Swine Fever**].—*Vet. Arhiv.* **6.** 362-368. [9 refs.] [Abst. from German summary].

The flesh from pigs affected with swine fever generally has an unusual odour when uncooked. In exceptionally severe cases of the disease it is even noticed when the meat is boiled or roasted. The meat has not the same taste as that from healthy animals. The smell and taste vary from unpleasant to nauseating, in proportion to the severity of the illness.

In an observation made, an odour almost similar to normal could be perceived in from 27 to 34 per cent. of cases, while in the remaining cases an abnormal, musty odour (as of urine, byre or mould), varying from unpleasant to nauseating was noted.

CERRUTI, C. F. (1936). Le attuali conoscenze sulla identificazione e classificazione dei batteri del gruppo paratifo B-enteritidis, agenti di tossi-infezioni alimentari. [**Present Knowledge on the Salmonella Group in Food Poisoning**].—*G. Accad. Med. Torino.* **99.** No. 1-3. Pt. 2. 3-6. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 711. Signed H. H. S.]

This short paper communicated to a meeting of members of the Academy of Medicine, Turin, relative to the antigenic structure of the Salmonella group was based on two outbreaks of food-poisoning. The first involved 15 boys under 14 years of age who suffered from gastro-intestinal disturbance lasting for 2-3 days ; symptoms came on after eating ice-cream. The organism isolated was *Bact. enteritidis*, Gaertner, type Jena. The second involved 70 persons. A sick horse was slaughtered ; its flesh was eaten by these 70, much of it raw. A few hours afterwards 62 of them were seized with violent abdominal pain, diarrhoea and vomiting, accompanied by rise of temperature. Two died in a week, the others made a tardy recovery. *Bact. aertrycke* was found to be the cause. [The article does not state the source from which the organism was isolated in either case].

THERAPEUTICS AND MATERIA MEDICA.

SCHLOSSBERGER, H., & SCHÜFFNER, R. (1934). Festigungsversuche an Trypanosomen mit Arsenpyridinderivaten. [**Experiments on Resistance in Trypanosomes with Arseno-Pyridine Derivatives**].—*Angew. Chem.* **47.** 768-771. 1 table. [Numerous refs.] [Also appeared in *Arb. ReichsgesundhAmt.* **67.** 577-584].

YORKE, W., MURGATROYD, F., GLYN-HUGHES, F., LESTER, H. M. O., & ROSS, A. O. F. (1936). **A New Arsenical for the Treatment of Syphilis and Trypanosomiasis.**—*Brit. med. J.* May 23rd. 1042-1048. 4 tables. [7 refs.]

Out of a large number of arsenicals of the same general formula, sodium succinanilo methylamid-p-arsonate (" neocryl ") was selected for detailed therapeutic trial. In animal experiments this compound was found to be rather less toxic, and to possess a somewhat greater trypanocidal activity, than " tryparsamide ". In man " neocryl " was well tolerated and exhibited in a pronounced degree the stimulating action associated with " tryparsamide " and the other pentavalent aromatic arsenicals. It exerted a definite action in all three stages of

syphilis and gave very satisfactory results in early neurosyphilis. Of 11 cases of Nigerian sleeping sickness treated by a single course of " neocryl ", ten became clinically normal and the other showed improvement.

The arsenopyridine preparations "BR I" and "BR 23" possess affinities to the protoplasm of the trypanosomes which "tryparsamide" and other derivatives of phenylarsonic acid do not have. The anchoring points of the arseno-pyridine compounds must partly differ from those of arsenophenylglycine. From the practical point of view these conclusions are important, as they indicate possibilities of cure in cases where organisms resistant to " tryparsamide ", " atoxyl ", etc., are involved.—J. M. Robson.

Singer, E. (1936). Die Wirkung der Chemotherapeutica auf die Trypanosomenzelle. [**The Action of Chemotherapeutic Substances in Trypanosome Cells**].—*Z. Hyg. InfektKr.* **117.** 752-756. [Copied *verbatim* from *Trop. Dis. Bull.* **33.** 672-673. Signed W. Y.]

Experiments were undertaken with the object of investigating, by means of the methylene blue decolourization method of Thunberg, the influence of chemotherapeutic substances on the dehydrases of trypanosome cells.

The technique employed was briefly as follows :–

In vitro experiments : A suspension of trypanosomes was obtained in plasma and sufficient 5 per cent. glucose and 0·1 per cent. methylene blue solutions added to make the final concentration of glucose 0·5 per cent. and that of methylene blue 1 in 50,000. To each of a series of small tubes 0·9 cc. of this suspension was added, and then 0·1 cc. of suitable concentrations of various drugs. After the air in the tubes had been exhausted by a powerful water pump the tubes were sealed and placed in a water bath at 37°C.

In vivo experiments : Mice at the height of a nagana infection were given an intramuscular injection of the various drugs, and then bled after suitable intervals. Trypanosome suspensions containing about 100 million trypanosomes per cc. were prepared and dealt with as above.

The action of the various drugs on the discolourization time of the methylene blue due to hydration of the trypanosomes was then examined. The results are given in a table in which the values are based on the time taken for the control tubes (without drug) to become decolourized. As the number of trypanosomes varied in the different experiments, the figures in the table which represent the results obtained in a number of experiments are calculated on the assumption that the controls were discoloured in 100 units of time.

The table shows that all the drugs which act on trypanosome infections, *e.g.* atoxyl, solusalvarsan, sulfoharnstoff, germanin and trypaflavin, hinder dehydration when present in higher concentrations, and increase it when present in lower concentrations.

From the *in vivo* experiments it appears that the trypanosomes, removed 20 to 30 minutes after the injection of an active dose of a chemotherapeutic substance, show a retardation of the dehydration process. The injection of active doses of a chemotherapeutic substance causes the disappearance of trypanosomes from the circulation through phagocytosis by the cells of the reticulo-endothelial system. It is known that this system takes up only such substances as wander towards the anode. Normally, trypanosomes migrate towards the kathode, and the question arises whether chemotherapeutic substances so change trypanosomes that they tend to pass towards the anode.

Eosin is not taken up by normal trypanosomes. When, however, this dye is injected into an infected mouse 2 to 4 hours after a dose of germanin, sulfoharnstoff or neosalvarsan, it is found, when blood preparations are examined under the

fluorescence microscope, that scanty trypanosomes have taken up the dye. The reason why so few stained trypanosomes are to be found is that the damaged individuals are immediately removed from the circulation by the reticulo-endothelium.

GUSEV, V. F., & GALENSKY, K. G. (1936). Profilaktičeskaya terapija piroplazmoza kr. rog. skota albarginom. [**The Prophylactic Treatment of Bovine Piroplasmosis with " Albargin "**].—*Sovyet. Vet.* No. 3. pp. 64-65.

The authors tested the prophylactic value of intravenous injections of " albargin " against piroplasmosis on 48 head of healthy cattle, on a Witebsk (White Ruthenia) farm where piroplasmosis had appeared. In 28 cases the dose was 1 g. of 1 per cent. solution of " albargin ". In the remaining 20 cases a dose of 1·5 g. was used. Twenty-five head of cattle were used as controls. For a month after the injections, the herd grazed on its former (tick-infested) pasture, after which it was moved to less infested fields. Three controls contracted *Babesiella bovis* infection. There was no case among the inoculated animals. Similarly successful results were obtained on another farm. The technique of the injections is discussed.

COLEBROOK, L., & KENNY, Méave. (1936). **Treatment of Human Puerperal Infections and of Experimental Infections in Mice, with Prontosil.**—*Lancet.* **230.** 1279-1286. 5 tables. [16 refs.]

BUTTLE, G. A. H., GRAY, W. H., & STEPHENSON, Dora. (1936). **Protection of Mice against Streptococcal and Other Infections by P-Aminobenzene-sulphonamide and Related Substances.**—*Ibid.* 1286-1290. 5 tables. [12 refs.]

—. (1936). **The Chemotherapy of Streptococcal Infections.**—*Ibid.* 1303-1304. [2 refs.]

—. (1936). **Chemotherapy for Streptococcal Infections.**—*Brit. med. J.* March 21st. 590. [2 refs.]

—. (1936). **Chemical Attack on Streptococcal Septicaemia.**—*Ibid.* June 13th. 1216. [3 refs.]

NITTI, F., & BOVET, D. (1936). Les septicémies streptococciques expérimentales et leur traitement par le p-amino-phénylsulfamide. [**Experimental Streptococcal Septicaemia and its Treatment with P-Amino-Phenylsulphamide**].—*C. R. Acad. Sci., Paris.* **202.** 1221-1223. [2 refs.]

Prontosil, a synthetic azo-dye, protects mice against inoculation with virulent haemolytic streptococci. Repeated subcutaneous injections are more effective than administration by stomach tube. A larger subcutaneous dose (50 mg.) protected mice against infection four days later. Thirty-eight cases of puerperal fever infected with haemolytic streptococci were treated with prontosil (oral plus intravenous or intramuscular administration) and the impression was gained that the drug had exerted a definite beneficial effect, especially in the more severe cases. The drug was well tolerated, but transient toxic effects occurred in some cases and there was evidence of a mild irritant effect upon the tissues of the urinary tract.

P-amino-benzene-sulphonamide has the same therapeutic activity in mice as prontosil, but it is less toxic when given *per os* ; it is, therefore, possible to obtain better protection by giving larger doses. Prontosil has also been observed to confer protection in rabbits. Protection can be obtained against streptococci belonging to different serological types. Some protection of mice against injections of meningococci was demonstrated, but it was impossible to demonstrate protection against staphylococci or pneumococci. Apart from the fact that growth of the

streptococcus is somewhat retarded (although not suppressed) in the serum of patients under treatment by prontosil, very little is known at present as to the nature of its bacterial influence in the animal body. On the one hand, the invasive character of the streptococcus seems to be unchanged by contact with the drug or with the serum of treated animals ; on the other hand, there is no evidence of any " immune-response " being evoked by it.—J. M. ROBSON.

MELENEY, F. L. (1935). **Zinc Peroxide in the Treatment of Micro-Aerophilic and Anaerobic Infections with Special Reference to a Group of Chronic, Ulcerative, Burrowing, Non-Gangrenous Lesions of the Abdominal Wall Apparently Due to a Micro-Aerophilic Haemolytic Streptococcus.**—*Ann. Surg.* **101.** 997-1011. 15 figs. [16 refs.]

The author describes in detail six cases of a chronic infection of the abdominal wall in the human subject characterized by slow ulceration uncomplicated by gangrene. Bacterial studies of the lesions yielded a micro-aerophilic haemolytic streptococcus with a preference for an anaerobic environment. This appeared to be the essential causative organism. All ordinary methods of treatment were without effect. The author finally took into use a suspension of zinc peroxide. This drug was suggested to him as one having the property of yielding its oxygen gradually over a period of days. Rapid improvement and cure resulted. The author subsequently experimented with this drug in the treatment of *Clostridium welchii*, *Proteus vulgaris* and other gas and gangrenous infections, with equally satisfactory results. The drug appears to have no irritating effect on tissues, granulation is not inhibited and healing is favoured.—C. DAVENPORT.

TAPKEN, A. (1936). Infusionsversuche mit Streptozon und Weidnerit an gesunden und kranken Eutervierteln. [**Udder Infusion Trials with " Streptozon " and " Weidnerit "**].—*Inaug. Diss., Hanover.* pp. 41. 5 tables. [12 refs.]

The author tested the chemotherapeutic action of intramammary infusions of " streptozon ", a product chemically allied to " prontosil ", on cases of streptococcal mastitis, and concludes that the results obtained warrant a more extensive trial of this substance. It was ineffective in cases of mastitis due to *Streptococcus pyogenes*. He found that the marked irritant action of 0·5 per cent. " weidnerit " solution on the udder prohibits its use.—N. J. SCORGIE.

NEUBAUER, K. (1935). Stúdie o vlivu kreosotu na alergiu tuberkulózneho skotu. [**The Effect of Creosote on Tuberculous Allergy in Cattle**].—*Zverolék. Rozpravy.* **9.** 260-264, 268-276 and 277-280. 5 tables. [Numerous refs.] [German summary : abst. from orig.]

The author reviews the literature relating to the curative effect of creosote on tuberculosis in animals and describes an experiment.

Seventy-five reacting cows were used. In one series, three 15 c.c. doses were given *per os* at intervals of ten days. In another series, each animal was given from 400 to 450 c.c. over a period of nine months. The animals were tested before and after treatment, and there was no change in their reactions to the ophthalmic and intradermal tests. The author concludes, therefore, that creosote has no effect on the tuberculin reaction in cattle.—E. PŘYBYL (BRNO).

OESTERLIN, M. (1936). Zur Chemotherapie des Infektionskrankheiten. [**On the Chemotherapy of Infectious Diseases**].—*Z. Hyg. InfektKr.* **118.** 263-306. 1 fig. [Numerous refs.] [Copied *verbatim* from *Trop. Dis. Bull.* **33.** 663-664. Signed W. Y.]

This long and rather technical paper must be consulted in the original by

those interested. It is shown that chemotherapeutic action is dependent upon the optical activity of a substance, and that both antipodes behave very differently against trypanosomes, just as the capacity to dye animal or vegetable threads by the same substances differs.

A series of mice were given 20 mgm. of casein-atoxyl compound on 1st October, and nine days later were infected with *T. brucei*. On the 13th October the mice were treated with various doses of atoxyl, and it was found that 0·8 mgm. sufficed to produce a permanent cure. In mice which had not received the preliminary dose of casein-atoxyl compound the maximum dose of 4·0 mgm. of atoxyl failed to produce a complete cure. This means that the effective dose of atoxyl is reduced to 20 per cent. when, as the result of a preliminary treatment of the experimental animal, the corresponding antibody has been produced. The phenomenon is strictly specific; previous administration of casein-atoxyl does not reduce the curative dose of tryparsamide or spirocide.

The toxicological and direct-acting factor in the metal-free derivatives of acridin and chinolin is bound up with the fluorescence of these substances. The fluorescent emissions of these substances were spectrographically absorbed and the relationship between fluorescence and activity ascertained. The activity of substances is only developed when there is a firm anchoring to the parasite cell. As a result of this firm binding the optical properties are changed; the exciting radiation is turned in the visible direction and the fluorescent colour is altered. In a table the author gives details regarding the colour in neutral solution, the fluorescence in neutral solution, the fluorescence in solution pH 6, the fluorescence in the trypanosome in ultra violet and in white light, and the trypanocidal activity in respect of 23 acridin and chinolin derivatives. It is noted that the fluorescence seen in the trypanosomes can be approached *in vitro* by adjusting the pH.

Fluorescent substances, such as rivanol, which possess no binding groups are inactive. It is suggested that in the trypanocidal acridin and chinolin the pentavalent nitrogen serves as the haptophore groups; rivanol, when changed into rivanol-methylsulphate, becomes trypanocidal.

Chemotherapeutic interference is not a biological but a pure physico-chemical phenomenon due to the occupation of the trypanosome receptors by feebly or completely inactive products, thus preventing the specific binding of active substances.

Experiments on interference have produced evidence that all such substances as the arsinic acids, chinolin and acridin compounds are anchored by the same constituents of the trypanosome cell.

I. Wachelau, E. (1935). Versuche zur Bekämpfung des Dasselbefalls beim Rinde. X. Beitrag. Derrispräparate, Lethane, Aracit-Shampoon, Buttermilch Schwefel-Kalklösung, Tephrosia-Extrakt. [**Control of Ox Warbles. X. Derris and Other Preparations**].—*Inaug. Diss., Hanover.* pp. 32. 14 tables. [14 refs.]

II. Bartels. (1936). Zur Bekämpfung der Dasselplage durch standardisierte Präparate. [**Standardization of Derris**].—*Berl. tierärztl. Wschr.* **52.** 100.

III. Bartels. (1936). Nochmals zur Bekämpfung der Dasselplage durch standardisierte Präparate. [**Standardization of Derris**].—*Ibid.* 214-215.

I. A comparison of some proprietary mixtures containing derris was made and the results are given.

II & III. As a supplement to his previous report [this *Bull.* **6.** 657.] Bartels publishes letters from two chemical firms which describe their methods of standardizing the derris they sell. These refer to " derrophen " and " derrilavol ".

—J. E.

WEINRICH, F. (1935). Versuche zur Bekämpfung der Räude bei Rindern mit Derrispräparaten. [**Derris Treatment of Cattle Mange**].—*Inaug. Diss., Hanover.* pp. 40. 5 tables. [Numerous refs.]

The author used preparations of derris to treat about 300 cattle affected with sarcoptic or chorioptic mange. He found that a 2 per cent. suspension of derris root containing 8 per cent. rotenone and 16 per cent. of residual extract in soapy water was very effective. Like rotenone the residual extract possesses mite-killing properties ; a wash containing whole derris extract is preferable to a refined preparation or to rotenone alone.—J. E.

GUREWITSCH, D. I., EGOROFF, S. W., POLTYREFF, S. S., & TSCHEREDKOFF, W. N. (1936). Ueber den Einfluss von Pilocarpin, Arecolin und Spiritus auf die Magensekretion des Pferdes. [**Effect of Pilocarpine, Arecoline and Alcohol on the Stomach Secretions of the Horse**].—*Arch. wiss. prakt. Tierheilk.* **70.** 243-250. 1 fig., 2 tables. [1 ref.]

The effect of drugs on gastric secretion was investigated by means of a gastric canula. Alcohol does not increase the gastric secretion. Pilocarpine appreciably increases the amount of fluid in the stomach, but the enzyme content in this fluid is low. Arecoline stimulates salivary and gastric secretion ; the enzyme content of the fluid secreted is very low.—J. M. ROBSON.

PALIMPSESTOW, M. A., & DJEGTERENKO, O. J. (1935). Dehelminthisationsmethoden bei Zestodosen der Hunde. [**Anthelmintics for Cestodes in Dogs**].—*Berl. tierärztl. Wschr.* **51.** 517-518. [7 refs.]

The anthelmintic action of arecoline hydrobromide was tested on 15 parasitized dogs, the effect being judged by faecal examination, collection of expelled worms and finally search for unexpelled worms at autopsy. It was concluded that this is a safe drug for the dog in doses of from 0·004 to 0·015 g. per kg. body weight, the standard dose for general use being 0·058 g. Doses of from 0·002 to 0·003 g. per kg., or a dose of 0·0009 to 0·052 g. had some effect on *Alaria alata*, *Ancylostoma caninum* and *Uncinaria stenocephala*, but not on other parasites. A dose of 0·058 g. acted on *Taenia*, *Echinococcus*, *Toxascaris* and *Toxocara*, but not on *Mesocestoides*.—E. L. TAYLOR.

BLEECKER, W. L., & SMITH, R. M. (1934). **Efficiency of Various Vermifuges when Tested under Field Conditions.**—*Bull. Ark. agric. Exp. Sta.* No. 312. pp. 33-34. [Copied *verbatim* from *Helminth. Abstr.* **3.** 146. Signed P. A. C.]

Bleecker administered turpentine and oil directly into the gizzard of 31 fowls to determine its action as a vermifuge against gizzard worms, small cestodes and Capillaria. He records " fair efficiency " but gives no details as to the exact number or species of worms eliminated.

In conjunction with Smith he has tested various vermifuges under field conditions. He treated various groups of hens with kamala and black leaf pellets, both separately and together but failed to find any significant differences between the numbers of parasites harboured by any one group as compared with its control.

LAMSON, P. D., STOUGHTON, R. W., & BASS, A. D. (1936). **Anthelmintic Studies on Alkylhydroxybenzenes. VI. Alkyl Polycyclicphenols. VII. Halogenated Phenols. VIII. A. Phenolic ketones. B. Phenolic Ethers and Esters. C. Organic Acids.**—*J. Pharmacol.* **56.** 50-52, 60-62 and 63-68. 6 tables. [28 refs.] [For abst. of previous articles of this series, see this *Bull.* **5.** 656].

VI. Alkyl radicals were introduced into certain polycyclicphenols and the compound tested *in vitro* on pig ascaris, but no increase in their vermicidal properties was found to result.

VII. The introduction of halogens into certain alkylphenols, when tested in the same way, was found to increase their ascaricidal properties, and p-chlorocarvacrol, 4-chloro-2-hexylphenol, and 4-chloro-2-heptylphenol were found to be particularly active.

VIII. More than 100 phenolic ketones, phenolic ethers and phenolic esters were tested *in vitro* for ascaricidal properties; the results were negative. Two monoethers of dihydricphenols, hydroquinol monoamyl ether and hexylresorcinol monoethyl ether were found to be ascaricidal *in vitro*, but were too toxic for *in vivo* tests. Some 30 organic acids, and 20 esters of simple aromatic and aliphatic acids were also tested and some found to have a definite slight ascaricidal action, but not such as is likely to be of value in anthelmintic treatment.—E. L. TAYLOR.

THIEMANN, A. (1935). Die Behandlung ovariell bedingter Unfruchtbarkeit und des Umrinderns ohne erkennbare Ursache mit Hormovilan (F 109) und dessen Einfluss auf die Milchsekretion beim Rind. [**Treatment of Ovarian Infertility with Hormovilan (F 109)**].—*Inaug. Diss., Hanover.* pp. 29. 4 tables, 2 charts. [2 refs.]

LASS, F. (1935). Behandlung der Anaphrodisie und des Umrinderns bei Kühen und Färsen mit dem Vitamin-Hormonpräparat F 109. [**Treatment of Infertility in Cows and Heifers with a Vitamin-Hormone Preparation (Hormovilan)**].—*Inaug. Diss., Hanover.* pp. 34. 5 tables. [12 refs.]

Both authors claim good results in cases of ovarian subfunction in cattle treated by the intramuscular injection of hormovilan [composition not precisely defined]. Cases of persistent corpus luteum suppressing ovarian activity also responded to the same treatment.—J. E.

MARQUARDT, F. (1935). Behandlungsversuche infektiöser Euterentzündungen der Kühe mit Kurzwellen. (Funkenstreckenapparat). [**Trials with Short-Wave Electrotherapy in Infectious Mastitis in Cows**].—*Inaug. Diss., Hanover.* pp. 61. 4 figs., 14 tables. [12 refs.]

Eight cows affected with various forms of mastitis were given repeated and prolonged treatments with a short-wave apparatus applied, by means of flat condensor electrodes covered with felt, to the individual quarters of the udder. The hyperthermia so caused was slight, a rise of only about 0·5°C. being obtained in the interior of the udder and no curative effect was obtained.—J. E.

POISONS AND POISONING.

HYKES, O. V., & DIAKOV, F. A. (1935). Antagonistický účinek kalium jodatum na toxicitu thallium aceticum. [**Potassium Iodide as an Antagonist to Poisoning with Thallium Acetate**].—*Biol. Spis. vys. Sk. Zverolék.* **14.** 85-100. 2 tables. [Numerous refs.] [Abst. from English summary].

Rats were dosed daily with thallium acetate, which acts as a general depilatory; it was found that, if potassium iodide was injected subcutaneously during the course of dosage, the toxic and depilatory effects of the thallium were much reduced. —J. E.

BYERS, H. G. (1935). **Selenium Occurrence in Certain Soils in the United States with a Discussion of Related Topics.**—*Tech. Bull. U. S. Dep. Agric.* No. 482. pp. 48. 4 figs., 30 tables. [20 refs.] [Abst. from abst. in *Exp. Sta. Rec.* **74.** 102-103].

The work done so far on selenium shows its source in soils to be sulphide

minerals occurring in the parent soil materials. Soils derived from, especially, shales of the cretaceous period may, if the rainfall is insufficient to cause percolation through the soil profile, retain sufficient selenium to produce toxic vegetation. The amount taken up by plants apparently depends upon (1) the quantity available, (2) the kind of plant, (3) the portion of the plant examined, and (4) the soil composition, especially its available sulphur content. Toxic areas of arable land should be withdrawn from cereal cultivation. Grazing lands may safely be left to the discretion of the owners. The subject needs study, and remedial steps should be undertaken, but the matter is not serious enough to warrant hasty measures.

HENRY, M., & BENJAMIN, M. S. (1936). **The Fluorine Content of Some Phosphatic Materials Used as Mineral Supplements in the Feeding of Sheep in New South Wales.**—*Aust. vet. J.* **12.** 8-13. [Numerous refs.]

Analyses were carried out by a modification of the Willard-Winter method. The results showed that fluorine is present in almost negligible amounts in samples of dicalcic phosphate (0·127 per cent.), bone meal (0·068 per cent.) and a bone meal product (0·033 per cent.). Ground rock phosphate contained as much as 2·511 per cent. and superphosphate 1·360 per cent. It is pointed out that if sheep consumed 3·5 oz. of a lick composed of four parts of salt and one part of rock phosphate, they would ingest 80 mg. of fluorine per day, an amount which has been shown to lead, after two years, to interference with the development of the teeth [this *Bull.* **2.** 509]. There is justification, therefore, for exercising caution where prolonged administration of phosphates containing large amounts of fluorine is likely.—H. McL. GORDON.

GRIMMETT, R. E. R., & MCINTOSH, I. G. (1936). **Suspected Zinc Poisoning in Pigs. (A Possible Danger in the Use of Galvanized-Iron Piping for Conveying Skim-Milk to Piggeries).**—*N.Z.J. Agric.* **53.** 34-37.

The deaths of several young pigs were reported from farms where new zinc-lined pipes were used to convey skim milk to the piggery. Considerable quantities of zinc were found in the pigs in both stomach and liver, and the authors suggest that the mortalities were the result of the ingestion of zinc lactate derived from the zinc lining.—C. S. M. HOPKIRK.

HEUBNER, W., & HÜCKEL, R. (1935). Einige Befunde bei oxalatvergifteten Hunden. **[Findings in Oxalate Poisoning].**—*Arch. exp. Path. Pharmak.* **178.** 749-754. 2 figs. [6 refs.] [Copied *verbatim* from *Physiol. Abstr.* **21.** 87. Signed A. C. WHITE].

An analysis of the findings in oxalate poisoning (enteral and parenteral) in 6 dogs is given. The kidneys contained on analysis most oxalate, and showed high values even several days after the drug had been stopped. Histological findings in the kidney after prolonged parenteral poisoning are described.

—. (1936). **Vi-Vi** (*Leucaena glauca*). **A Warning.**—*Rhod. agric. J.* **33.** 83-84.

It has been found that *L. glauca*, if ingested in large amounts by horses and swine, has a depilatory effect. The hair grows again after the plant is excluded from the feed. Ruminants are not affected, and find the plant very attractive and nutritious.—J. E.

I. HOSKING, J. R., & BRANDT, C. W. (1936). **The Toxic Principle of Ragwort** (*Senecio Jacoboea* L.).—*N.Z. J. Sci. Tech.* **17.** 638-644. 1 fig., 1 table. [12 refs.]

II. HOPKIRK, C. S. M., & CUNNINGHAM, I. J. (1936). **Biological Experiment**

with Jacobine Extracted from Ragwort by J. R. Hosking and C. W. Brandt. —*Ibid.* 645-648. 4 tables.

I. The authors give a description of alkaloids and methods of extraction from various species of ragwort throughout the world. They then describe their method for the extraction of jacobine which, they claim, is similar to the alkaloid isolated by MANSKE in Canada. $C_{18}H_{25}O_6N$ is the formula of their alkaloid, while that of MANSKE is $C_{18}H_{23}O_5N$. No saponins were detected in various specimens of ragwort growing in New Zealand.

II. The jacobine extracted by HOSKING and BRANDT was tested pharmacologically on guinea pigs and rats. Guinea pigs were found to be highly resistant, but rats were very susceptible to small doses. The picture noted by DAVIDSON in his work on retrorsine, of congestion of central hepatic veins and intralobular capillaries with haemorrhage from these vessels, was noticeable in rats given jacobine. There seemed to be an increase in endothelial tissue in guinea pig livers, and later fibrous tissue became apparent in guinea pigs and rats. There was an increase in bile capillaries in the livers of some of the rats and guinea pigs.

SCHROOTS, C. J. (1935). Voederproeven bij runderen met Mimosa invisa. [**Feeding Tests with** *M. invisa* **on Cattle**].—*Ned.-ind. Bl. Diergeneesk.* **47.** 196.

In continuation of the work of DOEGLAS [this *Bull.* **5.** 456.] who found that *M. invisa* was poisonous to a buffalo, three adult cattle and one calf were placed on a plot containing no grass and much mimosa. They starved voluntarily for eight days rather than touch the mimosa. They also refused to eat mimosa when chopped fine and mixed with grass and maize. The authors consider, therefore, that there is little likelihood that it is dangerous for cattle.—J. E.

RIMINGTON, C. (1935). **The Occurrence of Cyanogenetic Glucosides in South African Species of** *Acacia*. **II. Determination of the Chemical Constitution of Acacipetalin. Its Isolation from** *Acacia stolonifera*, **Burch.**—*Onderstepoort J. vet. Sci.* **5.** 445-464. 3 figs. [13 refs.] [For abst. of previous article of this series, see this *Bull.* **6.** 271].

An improved method is described for the isolation of acacipetalin (M.P. 176-7°; $[\alpha]_D^{26} = -36{\cdot}6°$), a new cyanogenetic glucoside present in South African species of *Acacia*. The tetra-acetyl derivative has M.P. 104° and $[\alpha]_D^{26} = -16{\cdot}2°$. Pinit, inositol monomethyl ether, was also identified as a constituent of *A. stolonifera*.

Acacipetalin is shown to be the glucose ether of dimethylketenecyanhydrin. This conclusion is based upon the identification of the following breakdown products :– on enzymic hydrolysis – hydrogen cyanide, glucose, acetone and acidic substances ; on acid hydrolysis – hydrogen cyanide, glucose and isobutyric acid ; after alkaline followed by acid hydrolysis – ammonia, glucose and isobutryl-formic acid. The latter substance was isolated as its 2 : 4 dinitrophenylhydrazone, M.P. 190°. The 2 : 4 dinitrophenylhydrazone of isobutylideneacetone crystallizes in orange-red prisms, M.P. 163-5°.

A suggestion is made as to the manner by which acacipetalin might arise *in vivo* from the condensation of glucose, acetone and formaldehydecyhyandrin.

GUEYNE. (1934). Intoxications alimentaires chez les porcs provoquées par le jus de cuisson des betteraves. [**Poisoning of Swine by Water in which Beetroots have been cooked**].—*Union vét., Bordeaux.* No. 13. pp. 5-8.

The author records cases of sudden death in pigs very soon after feeding on slop composed largely of water in which beetroot had been cooked.

He advances an opinion that the poisoning may have been due to the formation of muscarine or amanitine caused by the reduction of betaine extracted from the beetroots.—J. E.

PHYSIOLOGY.

Ross, I. C. (1936). **The Passage of Fluids Through the Ruminant Stomach. III. The Effects of Volume of Fluid and the Site of Stimulation on the Reflex Closure of the Oesophageal Groove. With a Note on the Influence of Size of Dose on Anthelmintic Efficiency.**—*Aust. vet. J.* **12.** 4-8. 2 tables. [4 refs.] [For abst. of previous article of this series, see this *Bull.* **5.** 457].

Continuing previous investigations, it was found that when copper sulphate solution was given to sheep through a stomach tube which reached only a few inches beyond the pharynx, passage of the fluid to the abomasum did not occur. On the other hand, when the pharynx was simply swabbed with copper sulphate, the passage of stained water to the abomasum was completely successful. It appears that the reflex mechanism involved in the closure of the oesophageal groove and the passage of the copper sulphate solution to the abomasum is very largely due to contact of the solution with the buccal or pharyngeal mucous membrane, and that the act of swallowing is not necessary to promote such action. There is a suggestion that the reflex is not as sensitive in aged as in young sheep. Results suggested that marked reduction in volume of the copper sulphate solution given might lead to lowering of anthelmintic efficiency owing to a greater proportion of the solution entering the rumen and reticulum when small volumes are given. When the volume was reduced from 20 to 10 c.c. (10 per cent. solution in both cases) there tended to be slightly less efficient passage of the solution to the abomasum. Reduction from 10 to 5 c.c. did not cause a further decrease in this efficiency. When a 10 c.c. dose was divided into two portions, almost the whole of the second 5 c.c. might pass directly to the abomasum, the first 5 c.c. having closed the oesophageal groove.

Preliminary tests indicated that, although there may be some decrease in anthelmintic efficiency where the same dose of copper sulphate is given to lambs in a volume of 5 c.c. as compared with 25 c.c., the more concentrated solution still gives evidence of high anthelmintic efficiency.—H. McL. Gordon.

Gurewitsch, D. J. (1936). Neue Bestimmungsmodifikation der Verdauungskraft des Magensaftes nach der Methode von Mett. [**Estimation of the Digestive Power of the Gastric Juices by Mett's Method**].—*Arch. wiss. prakt. Tierheilk.* **70.** 251-256. 2 tables. [11 refs.]

The author studied the relationship between the pH of gastric juice, its degree of dilution and the digestive power of the pepsin which it contains. It was found that gastric juice with a high pH has a low digestive power and that the latter is also dependent upon the length of time the juice has been allowed to stand. It appears, therefore, that the method hitherto used for the estimation of the digestive power of gastric juice cannot be accurate, since a series of physico-chemical conditions come into play which have not been taken into account.—J. A. Nicholson.

Jones, E. S. (1936). **Joint Lubrication.**—*Lancet.* **230.** 1043-1044. 4 figs. [9 refs.]

The author applies engineering principles to the study of human joints and

concludes that the usual form of lubrication is a fluid film lubrication, though some form of solid friction must occur when the speed and eccentricity are not enough to maintain a pressure film. The film survives a load which can crush bone.
—A. ROBERTSON.

SCHARREL, W. (1935). Untersuchungen über das Vorkommen von lymphadenoidem Gewebe in der Magenschleimhaut der Haustiere nebst vergleichenden mikroskopisch-anatomischen Angaben über die Schleimhaut und ihre Altersveränderungen. [**Lymphoid Tissue in the Gastric Mucosa of Domestic Animals**].—*Inaug. Diss., Hanover.* pp. 67. 22 figs. [Numerous refs.]

The gastric lymphoid tissue of all animals develops from small nodes in the stomach wall, but its final distribution varies in the different animal species and even in individuals of the same species. It appears to be unconnected with the glandular areas of the stomach and is usually present to a greater extent in the upper muscular layers between the different glandular areas. In the mucous membrane itself, the greatest amount of lymphoid tissue is found in the fundus region in herbivora and carnivora, whereas in omnivora it is found in the cardia. In hens, a diffuse lymph cell infiltration of the mucosa is found at the lower end of the oesophagus. This extends into the proventriculus and forms the so-called tonsils. The muscular part of the stomach is free from lymphoid tissue which recurs again at the entrance to the duodenum.—J. A. NICHOLSON.

I. ROBSON, J. M. (1936). **Hormones and Pregnancy.**—*Brit. med. J.* May 23rd. 1033-1038. [Numerous refs.]

II. THEOBALD, G. W. (1936). **A Centre, or Centres, in the Hypothalamus controlling Menstruation, Ovulation, Pregnancy and Parturition.**—*Ibid.* 1038-1041. [14 refs.]

I. Recent work has shown that the oestrone excreted during pregnancy in women is present in physiologically active and inactive forms. Although the total amount of oestrone excreted rises during pregnancy, the amount of physiologically active hormone remains low but rises immediately after parturition. The form in which oestrone is excreted by pregnant mares has not yet been established but it is known that oestrone production is largely independent of ovarian activity and, unlike the case in women, it is present in the blood in comparatively small amounts. On the other hand, large amounts of gonadotropic hormone appear in the blood of mares from about the 40th to the 50th days and disappear after the 90th to the 100th days, after which the corpora lutea regress. It appears certain that the hormonic control of pregnancy is not identical in all types of animal, but there are essential factors common to all.

II While it is not questioned that the oestrous cycle is controlled to a large extent by hormones circulating in the blood, evidence has been accumulating that, at any rate in women, there are one or more centres in the brain, probably in the hypothalamus, which are responsible for regulating the supply of these hormones and which are capable of exercising a direct effect on the reproductive processes. The fact that the oestrous cycle is rhythmic, that amenorrhoea may be caused by mental strain, fear, etc., and that the menstrual cycle can be changed by hypnosis, morphine, etc., point to the existence of such a centre. The author suggests that the centre is stimulated both by the ovarian hormones and by nerve impulses from the generative organs and from the higher brain centres. The afferent stimuli are provided by the ovarian hormones, generative organs and cerebral cortex and the efferent stimuli from the centre operate through the anterior pituitary gland and, to a certain extent, through the generative organs themselves.—J. A. NICHOLSON.

LANDAUER, W., & ABERLE, Sophie D. (1935). **Studies on the Endocrine Glands of Frizzle Fowl.**—*Amer. J. Anat.* **57.** 99-134. 10 figs., 4 tables. [Numerous refs.]

A comparative study was made of weight and histology of thyroid, adrenal, hypophysis and gonads of "frizzle" and normal chickens at the age of eight months. ["Frizzle" chickens differ from other breeds of fowl by a peculiar curling of their feathers, which are also very brittle and break off easily, leading to loss of plumage].

The birds were divided into three groups which were brought up under different conditions. The abnormalities found could all be explained by the defectiveness of plumage leading to loss of body heat and acceleration of metabolism.

—A. ROBERTSON.

I. ARNOLD, J. J. (1935). **Results of a Rabbit Ovulation Test for Equine Pregnancy.**—*Quart. Bull. Mich. agric. Exp. Sta.* **18.** 46-48. 1 table.

II. CREW, F. A. E. (1936). **Notes from a Pregnancy Diagnosis Laboratory 1935.**—*Brit. med. J.* May 16th. 993-996. 1 table, 1 graph. [12 refs.]

III. KARMANN, P. (1936). Die Feststellung der Trachtigkeit der Stute auf chemischem Wege durch den Nachweis des Ovarialhormons im Harn (Reaktion nach Cuboni). **[Cuboni's Chemical Urine Test for Pregnancy in Mares].**—*Tierärztl. Rdsch.* **42.** 225-227. [10 refs.]

IV. FRULLINI, P. L. (1936). La réaction de Cuboni pour le diagnostic de gestation chez la jument et la vache. **[Cuboni's Reaction for the Diagnosis of Pregnancy in the Mare and Cow].**—*Boll. Sez. ital. Soc. int. Microbiol.* **8.** 37-39. [3 refs.] [In French].

V. BEALL, D., & EDSON, M. (1936). **Some Notes on the Isolation of Oestrone and Equilin from the Urine of Pregnant Mares.**—*Bio-chem. J.* **30.** 577-581. 4 tables. [9 refs.]

I. The ovaries of sexually mature virgin rabbits were examined for the presence of corpora haemorrhagica 18 hours after the rabbits had received intravenous injections of 0·5 to 5 c.c. of serum from the mares to be tested. It was found that doses of 0·5 c.c. of serum did not give consistent results and that only three out of 16 tests were erroneous where a greater amount of serum had been used. The test may not give positive results until the 47th day after conception but appears to be reliable until the 82nd day.

II. Using Friedman's test and at the same time carrying out a confirmatory Aschheim-Zondek test, it is claimed that the error in the diagnosis of human pregnancy is not greater than 1·5 per cent. Errors appear more frequently at the beginning and end of the reproductive phase of life. There is as yet no satisfactory explanation for the fact that in some cases injections of urine kill the test animals. Precipitation of the excess of protein by means of hydrochloric acid has in a number of cases reduced the lethal quality of the urine. A plea is made that clinicians should furnish reports on the results of all tests in order to prevent valuable information being wasted.

III. The author compared the results obtained by the mouse test and Cuboni's chemical test [see this *Bull.* **6.** 276.] for the diagnosis of pregnancy in mares. Two hundred samples of urine were examined and only in one case did the results of the two tests differ. Cuboni's test appears to be satisfactory for the diagnosis of pregnancy after the 120th day of gestation. It possesses the advantage of being carried out more easily and quickly than either the Allen-Doisy or Aschheim-Zondek tests and, since no animals are used, the sources of experimental error are reduced.

IV. Using Cuboni's method, the author examined urine from 15 cows of

which nine were known to have been pregnant from six to eight months. A positive reaction was obtained in each case. The reaction, however, is not so clear as with urine from mares and in some cases it was necessary to evaporate the benzene extract to dryness. Positive or doubtful reactions were also obtained with urine from non-pregnant cows and from bulls.

V. Modifications in the process described by BEALL and MARRIAN [(1934). *J. Soc. Chem. Ind.* **53.** 309.] for the isolation of oestrone from the urine of pregnant mares are described. It is better to carry out the acid hydrolysis of the urine at room temperature than to boil or autoclave it. After seven to ten days at room temperature, the toluene extractions may be made. The solvent process and the mercuric hydroxide-ketone reaction have also been modified. By this method high yields of pure oestrone and considerable amounts of equilin may be obtained. It was found that the amount of oestrogenic material in the urine starts to increase during the 3rd month of pregnancy, reaches its maximum during the 7th to 8th months and then falls off rapidly so that at parturition only a relatively small quantity is present in the urine.—J. A. NICHOLSON.

I. KOCH, W. (1936). Der Einfluss des Testikelhormons auf die Befruchtungsfähigkeit der männlichen Zuchttiere. **[Influence of Testicular Hormone on the Fertility of Male Animals].**—*Berl. tierärztl. Wschr.* **52.** 113-114. 1 table. [4 refs.]

II. DEANESLY, R., & PARKES, A. S. (1936). **Note on Male Hormones and the Question of Accessory Substances.**—*Lancet.* **230.** 837-839. 1 fig., 4 tables. [8 refs.]

III. HETZEL, H. (1936). Die auf die Geschlechtsorgane wirkenden Hormone und ihre therapeutische Anwendung. **[Use of Gonadotropic Hormones].** —*Wien. tierärztl. Mschr.* **23.** 299-304 and 321-337. 1 fig. [Numerous refs.]

I. It is known that sterility is males with apparently normal reproductive organs may be due to environment, unsuitable food, etc., but the way in which such conditions produce their bad effect is unknown. Probably quantitative hormonal disturbances are produced. In order to ascertain if the administration of male hormone could produce any effect, experiments were carried out on poultry during the winter months, when the fertility of cocks is known to be low. Four groups of birds, each consisting of one cock and nine hens, were kept under identical conditions and two of the cocks received bi-weekly injections of " erugon ". The fertility of the eggs and the developmental powers of the chicks were recorded. It was found that 89 per cent. of the eggs from hens served by the treated cocks were fertile, whereas only 44 per cent. of the control eggs were fertile. No difference was noted in the developmental powers of the chicks. The author concludes that the testicular hormone influences spermogenesis or even the spermatozoa themselves.

II. The authors studied the activation of male hormone. Using castrated rats as the test animals and giving ten equal daily injections to groups of five or ten similar rats, it was found that the effect is only obtained when the activating substances are intimately mixed with the hormone. They have no effect when injected into another part of the body. An increase in the amount of oil in which the hormone is dissolved, or the addition of palmitic acid, greatly increases the effectiveness of both androsterone and testosterone.

III. After describing the nature and function of the various sex hormones, the author gives an account of several conditions in which hormonal therapy appears to be proving of some value. Hypoplasia or atrophy of the ovary and uterus, often seen in heifers, may be treated successfully by injections of prolan followed by oestrone. In addition to the usual treatment for cystic ovaries, injections of

pituitrin are of value and the recurrence of such cysts may be prevented by giving 1,500 to 2,000 mouse units of prolan every third day for four weeks. It is also suggested that fertility in multiparous animals can be increased by injections of small doses of prolan. These stimulate more follicles to ripen and produce more favourable conditions in the uterine mucosa for the implantation of the fertilized ova.—J. A. NICHOLSON.

I. CHICK, Harriette, & COPPING, Alice Mary. (1935). **The Water-Soluble B-Vitamins. IV. The Components of Vitamin B_2.**—*Bio-chem. J.* **29.** 722-734. 4 tables. [Numerous refs.]

II. COPPING, Alice Mary. (1936). **The Water-Soluble B-Vitamins. V. Note on the Two Types of Skin Lesion Occurring in Vitamin B_2 Deficiency in the Rat in Relation to Deficiency of Flavin and Vitamin B_6, respectively.**—*Ibid.* **30.** 844-848. 1 table. [8 refs.]

III. COPPING, Alice Mary. (1936). **The Water-Soluble B-Vitamins. VI. Flavin and Vitamin B_6 in Cereals.**—*Ibid.* 849-856. 2 tables. [17 refs.]

I. Controversy still rages round the various components of vitamin B_2. Vitamin B_2 is defined as a heat-stable constituent of the vitamin B complex which must be added to diets containing all other dietary essentials, including the anti-neuritic vitamin B_1, in order to maintain growth and health in the rat and prevent occurrence of dermatitis (" rat pellagra "). Experiments carried out on rats indicated that vitamin B_2 is composed of two constituents (1) flavin, and (2) a supplementary substance contained in yeast extract. This supplementary substance appeared to be identical with vitamin B_6 described by GYÖRGY. Addition of one or other of the components to the basal diet deprived of vitamin B_2 neither restored growth nor had any real curative effect upon the characteristic " florid " dermatitis or the more generalized type of skin disorder of rats suffering from vitamin B_2 deficiency. Addition of both components, however, quickly effected a cure of either type of skin disorder and normal growth was immediately restored.

II. The experiments described in this paper were instigated to find out if vitamin B_6 could really prevent the florid type of dermatitis as had been suggested, since the writer herself had not been able to correlate vitamin B_6 deficiency specifically to the florid type of dermatitis. However, a series of prophylactic experiments with young rats maintained on diets lacking only one component of vitamin B_2 showed that those deprived of flavin developed the more generalized type of skin lesion, whilst those deprived of vitamin B_6 developed the florid type of dermatitis. In the former case, cures were observed and growth restored in five rats out of ten by administration of pure flavin. In the latter case, speedy and complete cures were obtained by administration of vitamin B_6 as an alcoholic extract of white maize or wheat, but the cure was more irregular and imperfect when vitamin B_6 was given in the form of a yeast preparation.

III. The experiments related in this article were carried out to show the relative amounts of the two components of vitamin B_2 present in whole maize, wheat and their milled products. The results showed that wheat and maize are good sources of vitamin B_6 and that from one-third to one-quarter of the vitamin B_6 present can be extracted by cold 80 per cent. alcohol. Wheat, on the other hand, contained a greater amount of flavin than maize, but no flavin was extracted by cold 80 per cent. alcohol. The vitamin B_6 in both wheat and maize appears to be present in greater amount in the germ and integuments than in the endosperm.
—JAMES STEWART.

BIELY, J., & CHALMERS, W. (1936). **Vitamin A Requirements of Growing Chicks. I. Preliminary Studies with " Reference " Cod Liver Oil.**—*Canad. J. Res.* **14.** Sect. D. 21-24. 1 fig., 3 tables. [6 refs.]

In addition to the basal ration, four groups of chicks were given supplements of vitamin A once a week at the respective rates of 25, 50, 75 and 100 international units per day. " Reference " cod liver oil was made up into standard solutions containing the seven-day quotas of 175, 350, 525 and 700 international units per c.c., and fed directly into the crop by pipette in 1 c.c. amounts, once a week. It is concluded that 75 international units of vitamin A per day would ensure normal growth and protect chicks up to eight weeks old against any symptoms of vitamin A deficiency.—E. A. WATSON.

TECHNIQUE.

PONDER, E. (1935). **The Measurement of Red Cell Volume. VI. The Different " Fragility " of the Red Cells of Various Mammals.**—*J. Physiol.* **83.** 352-358. 2 tables, 1 chart. [10 refs.] [Summary copied *verbatim*].

I. The fact that the red cells of different mammals show different fragilities in hypotonic serum is shown to be due to the different types of cell assuming different critical volumes, *i.e.* swelling to a different extent without losing haemoglobin. Differences in water content and in the extent to which the cells behave as " perfect osmometers " play only a minor part in determining the fragility.

2. In the four types of cell studies (sheep, ox, rabbit and man), the maximum increase in cell area compatible with the integrity of the cell is a linear function of cell volume. This is accounted for by supposing that the thin layer of the envelope upon which permeability depends does not undergo thinning as it is stretched, but that it is augmented during its extension by a transference of materials from neighbouring regions of the cell envelope.

MISCELLANEOUS.

LECLAINCHE, E. (1936). Histoire de la Médecine vétérinaire. [**History of Veterinary Medicine**]. pp. xv + 812. Toulouse: Office du Livre. [4to] [Fr.80].

This great work deals mainly with the veterinary schools and institutions of the world, but it also has sections on ancient veterinary medicine, on contagious diseases of the past, and on the veterinary practitioner in olden and recent times. —J. E.

—. (1935). Balti Riikide II VeterinaarPäevluse. [**Proceedings of the Second Veterinary Congress of the Baltic States : Tartu and Tallin, August, 1935**]. 2 Vols. Protokollid pp. 74 ; Referaadid pp. 87. 2 figs., 3 tables, 2 charts, 3 photographs. [Numerous refs.] [In German or Russian]. Tartu : K. Mattieseni trükikoda. [8vo].

The above publications contain a report of the social and scientific aspects of the congress, which is held biennially by the states of Estonia, Latvia and Lithuania. Prof. ROOTS, Estonia, was president of the second congress. Papers on veterinary organization and on animal diseases in the Baltic States were read and discussed. [These are being abstracted separately in this *Bulletin*].—J. E.

I. HERODES, A. (1935). Ueber die gemeinsamen Grundlagen für die Veterinär-administrationen der baltischen Staaten. [**The Common Foundations for Veterinary Administration in the Baltic States**].—*Balti Riikide II Vet-Päevluse Ref.* pp. 3-11. [In German].

II. CIRULIS, E. (1935). Die Organisation des Veterinärwesens in Lettland. **[Veterinary Organization in Latvia].**—*Balti Riikide II VetPäevluse Protokoll.* pp. 22-24. [In German].

III. JANKAUSKAS, S. (1935). Organizacionnoe ustrojstvo grazdanskoj veterinarii v Litve. **[The Control of Bovine Tuberculosis in Lithuania].**—*Ibid.* pp. 24-39. [In Russian: abst. from German summary].

I. The author gives a summary of the evolution of veterinary science. He outlines the legitimate field of work of a state veterinary service and makes a plea for the state veterinary services of Estonia, Lithuania and Latvia to be organized on a common basis for the common good of these three countries.

II. The organization of the State Veterinary Service in Latvia follows the usual practice and each of 73 districts in the country has its veterinarian, who may have a " feldscher " [man with an elementary veterinary training, presumably a type of " dresser "] working under him. A law was passed in 1934 defining the field of activity of the state veterinary service, which regulates the care of sick animals, meat inspection, exports and imports of meat, etc., markets and breeding studs. Plans for the improvement of district veterinary service are outlined.

III. Lithuania also has a state veterinary service. In order to increase the number of veterinary surgeons, a veterinary department of the medical faculty of Kaunas University was founded in 1922. This was, however, dissolved in 1928 owing to difficulties in operation, and since then candidates have been sent abroad for instruction. Meanwhile, a " feldscher " service was founded. There are now 115 veterinarians and 150 " feldschers " in the state service in Lithuania and they do clinical and meat inspection work. Fees for treatment are fixed.

In the discussion on the above papers, comparisons between the field of action and mode of work of the veterinary services in Estonia, Latvia and Lithuania were made.

A resolution was passed by the delegates calling attention to the need for a common level of legal status and of authorized fields of work for the veterinary services in the three countries. No more " feldschers " should be trained and all practitioners should be provided with a pharmacy for the dispensing of medicines at fixed prices.—J. E.

I. GREENWOOD, M., HILL, A. B., TOPLEY, W. W. C., & WILSON, J. (1936). **Experimental Epidemiology.**—*Spec. Rep. Ser. med. Res. Coun., Lond.* No. 209. pp. 204 + xii. 10 figs., 46 tables. [Numerous refs.] London: H.M. Stat. Off. [8vo] [3s. 6d.]

II. —. (1936). **Experimental Epidemiology.**—*Brit. med. J.* June 6th. 1165-1166. [1 ref.]

III. —. (1936). **Mice and Men.**—*Lancet.* **230.** 1362-1363. [1 ref.]

I. The studies outlined in the report above have been in progress for some 15 years and they form an attempt to place the science of epidemiology on an experimental basis. They are laborious and costly and the authors justify both the labour and the expense involved in the introduction. Although it is well known that animal hosts and their microbial parasites vary in resistance and infectivity respectively, and that many other factors play their part in the form which an epidemic disease takes, when all the odd pieces of knowledge are added together the answer is only a working hypothesis and not a conclusion. In other words, the many questions regarding epidemics can only be answered by finding out actually what happens in an infected herd, not by deducing what might happen from knowledge of what occurs in individual hosts. The herd must be the universe of study.

The experiments on which the report is based have involved the use of between 100,000 and 200,000 mice, and a brief outline of the general methods of experiment are given. It has been possible to maintain herds for months or years infected with bacterial parasites such as *Salmonella typhi-murium* and *Pasteurella muriseptica* without any cross-infection and to watch the effect of various methods of interference on the spread of infection. Experiments have also been made with herds infected with the virus disease ectromelia.

From statistical analyses of the results, it is concluded that in herds of mice living in close and continuous contact and subject to the continuous or intermittent immigration of susceptibles, the disease will never normally die out. It might happen that the disease would become extinct but such an event would be a mere accident of small numbers. The form of the mortality curve depends mainly upon the rate of immigration and the equilibrium between hosts and parasites is fundamentally unstable and, when disturbed, the system tends to pass through a period of violent fluctuations before equilibrium is again established. The average resistance of surviving mice increases with survival in the herd but never becomes absolute. The great majority eventually succumb to the reigning disease.

Selection, both by death of the more susceptible, and by natural immunization, plays a part in the increased resistance displayed by surviving mice, and the latter is probably the more important. An infected herd is a highly complex system, consisting of mice suffering from a fatal infection, others in a state of infection-equilibrium that ends in death or recovery at some later period, others undergoing natural immunization by an infection of slighter degree, and a small minority not yet infected. The differences in the form which epidemics display are due to the state of equilibrium established in this complex system, which may be shifting or temporarily stabilized.

The level of mortality in a herd, the proportion of immunizing to fatal infections, and the degree to which infection occurs, are largely determined by the characters of the bacterial strain with which the epidemic is initiated. It is considered that virulence and infectivity may vary, a highly potent " epidemic " strain possessing both these characters.

Apart from changes in the conditions of contact, the only significant method of interfering with the normal course of events in the infected herds is artificial immunization. It has not, however, under the conditions of these experiments, approached the successes recorded from the field. As with natural immunization, so artificial immunization has appeared to be more effective against the virus disease (ectromelia) than against the bacterial disease (mouse typhoid). In no case, however, is the immunity attained complete, the immunized mice eventually dying from the prevailing disease. Infection of immunized animals is common and in ectromelia, and probably in the bacterial diseases, many of the immunized and infected mice are infective for normal animals. It is, therefore, unlikely that, even if it were possible to devise a method of immunization more effective in lowering mortality than those employed by the authors, infection could be eliminated from the herds and so render safe the admission of susceptible immigrants.

As stated in the preface

" the experimental epidemic affords a more natural, and more severe, method of testing the value of any prophylactic procedure than assays carried out by more artificial tests on individual animals. It can never, of course, replace field observations made under completely natural conditions ; but it may well indicate possible solutions to many of the more important practical problems, and so direct the field epidemiologist along the most fruitful lines of inquiry."

II & III. Annotations on the report.—R. Lovell

CHEATLE, G. L. (1936). **Inflammation : Hunter's Views and Modern Conceptions.** —*Brit. med. J.* June 6th. 1148-1150.

This is part of the Hunterian oration for 1936. It might almost be said to be a Listerian oration, for the conception held by HUNTER of inflammation as a process of activity and of repair as being due to the increased vascularity resulting from inflammation is considered unsuitable. The author ranges himself with LISTER, for whom diminished activity and loss of function were the fundamental changes in inflammation. He would exclude repair from the province of inflammation were it not " that the removal of so important a keystone from the more general and popular conception of inflammation so weakens its fabric that it begins to totter ". [These views are in marked contrast to those expressed by SPILSBURY in the Croonian lectures for 1936. He considers that inflammation must inevitably include repair and suggests " the local reaction of the living to the dead and dying " as a suitable working conception].—E. G. WHITE.

MINETT, F. C., & MARTIN, W. J. (1936). **Influence of Mastitis and of *Brucella abortus* Infection upon the Milk Yield of Cows.**—*J. Dairy Res.* **7.** 122-144. 9 tables. [22 refs.]

The difficulty is pointed out of assessing statistically a depression in milk yield due to disease. Corrections have to be made for age, length of dry period, service period, and month of calving. Comparisons can only be made with animals of the same breed living under the same conditions, while diseases other than those being considered, which may also affect the yield, must be excluded. Most previous efforts have been unsatisfactory because rigid attention was not paid to these points.

The literature on the subject, nearly all of which relates to *Br. abortus* infection, is reviewed.

The observations were made in two tuberculosis-free herds. Periodical examinations were made for mastitis by bacteriological examination of the milk of individual cows and for *Br. abortus* infection by agglutination testing, and the animals were then arranged in four categories, *viz*, M– A–, M+ A–, M– A+, M+ A+, (+indicating infection and – freedom from infection). The mastitis was chiefly of the chronic streptococcal kind, while actual abortions were few.

The yields from 180 lactations in 139 Ayrshires and from 193 lactations in 138 Fresians were examined statistically, the records being standardized by Sanders' method. When the total lactations of all cows were considered, the average reduction in yield per lactation was 954 lb. due to mastitis and 1,685 lb. due to mastitis and abortion combined. In all these cases the defect in yield was of statistical significance. Sanders' method, however, is less suitable for this class of work than one based on the milk yield of cows known to be free from the common contagious diseases of cattle. When this more suitable method is used, differences in yield between healthy and diseased cows, insignificant by Sanders' method, become more prominent or attain significance.

In terms of percentage fall in yield by comparison with that for healthy cows, the results may be expressed as follows :– among the Ayrshires mastitis reduced the corrected yield on an average by 10·8 per cent. ; among the Friesians the percentage loss was higher, averaging 16·5 and 19·5 respectively in the two herds. Among the Friesians forming one herd the percentage reduction in corrected yield due to *Br. abortus* infection averaged 20·7, in spite of the fact that these animals did not abort. The reduction in yield was thus much more serious among Friesians than among Ayrshires, and this was not an age effect.

CUNNINGHAM, I. J. (1936). **Influence of Manurial Treatment with Magnesium Compounds on the Magnesium-Content of Pasture.**—*N.Z. J. Sci. Tech.* **17.** 775-778. 2 tables. [2 refs.]

This work was carried out in an attempt to gain some knowledge of magnesium increase in pasture, so that a method could be devised to overcome hypomagnesaemia of cattle.

A latin square of small plots was employed, using for top-dressing Epsom salt, dolomite and carbonate of lime.

There was an increase of Mg in the pasture after treatment with magnesium compounds; 8 cwt. per acre Epsom salt increased the Mg content by 20 per cent., while one and two tons increased the content by 40 per cent. and 60 per cent. respectively.

Dolomite was less efficacious.—C. S. M. HOPKIRK.

SCHWENK, J. (1935). Tropismos e tactismos. [**Tropisms including Thigmotropism**].—*Ann. Paulist. Med. Cirurg.* **30.** 213-227. [Copied *verbatim* from *Trop. Dis. Bull.* **33.** 86. Signed H. H. S.]

A disquisition on tropisms in general but treating mainly of thigmotropisms and taking into account not only helminths but also insects. No original experimental work is recorded.

NEUMANN-KLEINPAUL, K., & STEFFAN, H. (1935). Der III. Ableitungsort des Elektrokardiogramms beim Pferde. [**The Site of the Third Lead for the Electrocardiogram in Horses**].—*Arch. wiss. prakt. Tierheilk.* **69.** 401-409. 13 figs. [7 refs.]

Continuing their previous work [see this *Bull.* **3.** 743.] the authors describe their research with a view to locating a third lead for the electrocardiogram for the horse, as in human practice. The site for the third lead in the horse was finally found to be the rectum, along which a suitable metallic lead was passed. Several electrocardiographs are reproduced.—J. E.

WILLIAMS, W. L. (1936). **Observations upon Some Aspects of Horse Breeding.** —*Vet. J.* **92.** 119-126. 4 tables. [5 refs.]

The original is an analysis of the breeding records of New York State College of Agriculture from 1910 to 1931. Although the material was limited, useful facts resulting from the observations indicate that mares first bred when between three and three and a half years old are most fertile; that mares served not at the first but at the second or later oestrus within 100 days of a parturition are most fertile; and that a gestation period of between 321 and 339 days is most favourable both for the health of the dam and of her foal.

The value of examinations of spermatozoa of sires is also emphasized.—J. E.

—. (1936). **Establishments Licensed for the Propagation and Sale of Viruses, Serums, Toxins, and Analogous Products [Human].**—*Publ. Hlth Rep., Wash.* **51.** 247-253.

A list is given of the laboratories, both American and foreign, with the biological products prepared by each. Certain products would be of use for animals.—J. E.

OFFICIAL AND OTHER REPORTS.

GREAT BRITAIN. (1936). **Twenty-Fifth Report of the Development Commissioners being for the Year ended 31st March, 1935.** pp. 141. London: H.M. Stat. Off. [8vo] [2s. 6d.]

Of the sum of money placed at the disposal of the Commissioners in 1934 to 1935, £49,000 was expended on veterinary research institutions by annually recurring or special grants, and £29,000 on animal genetics, dairy research and animal breeding: the veterinary institutions are:– the Institute of Animal Pathology, Cambridge University; the Research Institute of the Royal Veterinary College, London; the Veterinary Laboratory of the Ministry of Agriculture, Weybridge; the Foot and Mouth Disease Commission, and the Animal Diseases Research Association of Scotland. In each case, a short note is given on the number and grading of the staff and the sum granted.

The investigations in progress at the institutions supported by the grants from the Development Fund are described in reports issued by the Departments and are reviewed in the reports of the Agricultural Research Council [this *Bull.* **6.** 284].

In addition to the research and advisory work aided, special grants were made for investigations conducted by other agencies; some of these are temporary investigations approved by the Agricultural Research Council. It is also noted that two Studentships for Research in Animal Health were awarded.—J. C. W.

GREAT BRITAIN. (1936). **Reports on the Work of Agricultural Research Institutes and on Certain Other Agricultural Investigations in the United Kingdom, 1933-1934.** pp. 351. [Numerous refs.] London: H.M. Stat. Off. [8vo] [5s.]

This annual volume gives brief summaries of the research schemes worked upon by the various institutes, including veterinary research institutes, and lists of original articles published by the research staffs.

Section F deals with Animal Pathology, and includes the reports of the Research Institute of the Royal Veterinary College, London, the Institute of Animal Pathology, Cambridge, the Veterinary Laboratory of the Ministry of Agriculture, Weybridge, the Animal Disease Research Association, Edinburgh, and the Veterinary Research Division of the Ministry of Agriculture, Northern Ireland.

Section III of the report gives a list of special investigations at numerous institutes; among them are several veterinary items.

The report should be obtained by all interested in veterinary research as carried out in Great Britain.—J. E.

CITY OF ABERDEEN (GREAT BRITAIN). (1935). **Report on Veterinary Services.**—*Rep. med. Offr Hlth Aberdeen, 1934.* pp. 59-61. 4 tables.

Inspection of cows and premises is carried out quarterly and auction marts are inspected weekly; in each instance, one case of tuberculosis coming within the scope of the Tuberculosis Order of 1925 was found and the animals were slaughtered. Supervision of animals landing from Ireland comprises the bulk of the work under the Diseases of Animals Acts. No licences have been issued for the production of "Certified" or "Grade A (T.T.)" milk.

MEAT INSPECTION.—Tables show the number of carcasses inspected and the amount of meat seized as unfit for human food. Particulars of the diseases found are given.—J. C. WALLACE.

IRISH FREE STATE. (1934). **Third Annual Report of the Minister of Agriculture 1933-34.**—*Gen. Rep. Dep. Agric. Ire.* pp. 28-40, 67, 109-111, and pp. 39-41 of the appendix.

VETERINARY COLLEGE OF IRELAND [see this *Bull.* **6.** 289].

VETERINARY RESEARCH LABORATORY.—A table shows the number of samples

tested for infectious disease; one case of mange, 134 cases of sheep scab, and 37 cases of swine fever were diagnosed.

Vaccines against *Brucella abortus* infection, braxy and blackleg were issued, and research into bovine contagious abortion, tuberculosis and bovine sterility was continued.

Veterinary Dispensary Scheme.—Forty dispensaries for the treatment of animal diseases were in operation and nearly 3,000 cases were treated during the year.

Diseases of Animals.—The incidence of scheduled diseases is briefly given. Swine fever showed a decrease, as did also bovine tuberculosis and sheep scab, in both cases to a smaller extent.—J. E.

Irish Free State. (1936). **[Report of the] Veterinary College of Ireland [1934-35]. II. [Report of the] Veterinary Research Laboratory [1934-35]. III. [Report under] Diseases of Animals (Ireland) Acts, 1894-1934; Dogs Act, 1906; Poultry Act, 1911.**—*Rep. Minist. Agric. Irish Free State 1934-35.* pp. 36-47 [31], 74, and 115-118 [50-54]. 11 tables.

I. The number of students was 103: of these 22 were new entrants and 13 graduated during the year. The report deals with diagnostic work and with the general incidence of disease.

Poultry.—Coccidiosis and tuberculosis head the list; salmonella infection comes next in order. The number of whole carcasses received and agglutination tests made was 87,608; 84,115 of the tests were for *Salmonella pullorum* infection. The adoption of control measures based on the use of this test is considered to have a beneficial effect. Thus in 1934-1935 the average percentage of positive reactors in the flocks tested was 4·4 per cent. as compared with 6·8 per cent. in the previous year. The number of outbreaks recognized was 83, a decrease of 39 from 1933.

Cattle.—Of 892 blood samples tested for *Brucella abortus* infection, 85 gave positive reactions. Of 65 samples of milk examined, mastitis was found to be due to streptococci in 28 cases, to staphylococci in 9, to *Corynebact. pyogenes* in 6, and to tubercle bacilli in one instance only.

Horses.—Samples of faeces were examined for the presence of worm eggs and larvae and particular attention was paid to the identification of strongyles of the caecum and double colon. Of the 112 samples of faeces examined, strongyle eggs were found in varying numbers in 107, worm eggs were absent from 13 and eggs of *Ascaris equorum* were present in two. Investigations were made into the cause of sterility of mares and its treatment.

Sheep and Goats.—Two cases deserving mention are tuberculosis of bovine origin in a ewe (the first ever encountered in Ireland) and osteomalacia in a milch goat.

Pigs.—Swine erysipelas, tuberculosis, ascaridia infestation and gastro-enteritis were the diseases chiefly found in pigs.

Dogs and Cats.—Distemper, chronic nephritis, endocarditis and illness due to parasites of the alimentary tract and of the skin were the principal diseases diagnosed in dogs and cats.

II. The work of the Veterinary Research Laboratory consisted of:–

(a) Diagnosis and Advisory Work.—6,550 specimens were dealt with. Of these 1,357 were diagnosed as *Br. abortus* infection and 4,600 as tuberculosis. Of the eight specimens sent in as suspected anthrax, one was positive.

(b) Preparation and Issue of Vaccines.—During the year 3,815 doses of anti-abortion vaccine, 15,235 doses of braxy vaccine and 5,212 doses of formolized blackleg vaccine were issued.

(c) RESEARCH WORK.—Research was continued on vaccination against *Br. abortus* infection, on tuberculosis of swine, on the incidence of tuberculosis in milch cows and on " louping ill " in sheep.

III. No change was made during the year in the list of diseases dealt with under the Diseases of Animals Acts. 6,376 cases of bovine tuberculosis were dealt with as compared with 3,711 in the previous year. The total number of actual " outbreaks " was 3,362 and the number of animals slaughtered was 3,673.

2,003 animals were affected with sheep scab compared with 2,377 in the previous year. There is always danger that infection may spread from infected flocks, concerning which reports were not made by the owners.

The cleansing and disinfection of vehicles, vessels, etc., used in transport, the conditions of shipment, the fitness of the animals for transit and their freedom from disease received close attention at the various ports.—M. BURKE.

INDIA. (1936). **Annual Report of the Imperial Council of Agricultural Research for the Year 1934-35.** pp. iii + 109. New Delhi : Govt. India Press. [8vo] [Re.1] [1s. 9d.]

An outline of the Council's activities on animal health and animal husbandry is included in the report. It is stated that endeavours are being made to stimulate research in the various branches of animal husbandry. It is considered that much useful information is being provided by Veterinary Investigation Officers, and a number of recommendations are made with a view to improving and co-ordinating the results achieved.

The programme of work comprises further investigation into vaccination of cattle against rinderpest to ascertain the best method of obtaining virus and distributing it in the field. The necessity of certain precautions in regard to its general adoption is also the subject of enquiry.

An epidemiological survey of Johne's disease and a study of the diagnosis and chemotherapy of the infection will be conducted. The introduction of a bill to promote measures for the prevention and control of animal diseases applicable to India generally is still under consideration.

The Animal Husbandry Bureau, which has now been started, proposes to develop the statistical branch of its work. Studies in regard to animal nutrition are to be extended and a scheme for the establishment of a special institute for this purpose is under consideration.—G. K. WALKER.

SOUTHERN RHODESIA. (1936). **Report of the Chief Veterinary Surgeon for the Year 1935.** [SHARPE, G. C. H.] pp. 16. Salisbury : Rhodesian Printing & Publishing Company, Ltd. [fcp].

The veterinary staff numbered 13 and there were 67 cattle inspectors on duty during the year.

The health of the livestock was satisfactory and not much impaired by drought or by locust invasions.

A veterinary conference was held at Salisbury in February to decide on a policy for the control of foot and mouth disease ; energetic measures were then adopted and, on an outbreak being discovered, all cattle on the farm were isolated and all in-contacts artificially infected by blood inoculations. A cattle-free belt was also formed and patrolled by native police. The disease was finally checked in June, since when no fresh cases have been observed. The history of the outbreaks is given in great detail.

East Coast fever came next in importance and caused the loss of 124 animals, mainly around Salisbury. The infected herds were slaughtered and no case was observed after August.

Short notes are also given on other diseases which are encountered either continually or occasionally. Heartwater increased owing to the extension of the area infested by the vector ticks, *Amblyomma hebraeum* and *A. variegatum*. A few tuberculous pigs were observed at Umtali abattoir.—J. E.

SOUTHERN RHODESIA. (1936). **Report of the Director of Veterinary Research for the Year 1935.** [LAWRENCE, D. A.] pp. 9. Salisbury: Rhodesian Printing & Publishing Company, Ltd. [fcp].

ROUTINE WORK.—Some results of diagnosis from smears are given. *Theileria mutans* was only observed in four cases as compared with 542 cases in 1934. Eighty-eight of 616 samples of serum were positive for *Brucella abortus* infection. Immunization against piroplasmosis and anaplasmosis and against horse-sickness was continued, the neurotropic virus obtained from Onderstepoort being employed with great success against the latter.

At a veterinary conference between Northern Rhodesia, Nyasaland and Southern Rhodesia, a scheme for the eradication of bovine tuberculosis was decided upon.

RESEARCH.—Three cases of breakdown in immunity against horse-sickness after inoculation with the Onderstepoort vaccine were investigated, and the virus concerned was obtained for study and for incorporation in the vaccine in future.

Research concerning the efficacy of *Anaplasma centrale* as a vaccine against *A. marginale* infection was continued. Certain difficulties in the way of immunization against piroplasmosis are also described: the " virus " content of the blood of carriers varies extremely. " Acaprin " was tested on dogs and cattle for value against piroplasmosis and gave excellent results.

The undiagnosed disease of bovines, described in last year's report [this *Bull.* **6.** 562.], was still under investigation.

An experiment was made with the object of finding out whether or not cattle and draught oxen could thrive in an area declared by local farmers to be unworkable on account of trypanosomiasis. The state of things there was, however, believed by the veterinary authorities to be due more to bad management than anything else. A 1,000 acre farm was taken over and run in a normal way, but with attention to good husbandry, from November, 1932, to September, 1935. The animals were examined and treated when necessary for trypanosomiasis. Twenty out of 33 head of cattle became infected, with one death. It was concluded that farming in the district was perfectly feasible.

An important investigation relating to immunity against foot and mouth disease was made. The result appeared to indicate that immunity after intranasal infection does not last more than five months, or that a mutation of virus can occur in a single passage or generation. In a viability test, foot and mouth disease virus did not survive more than four days in tobacco as packed for export.—J. E.

NORTHERN RHODESIA. (1935). **Annual Report of the Department of Animal Health For the Year 1934.** [MORRIS, J. P. A.] pp. 39. 1 table. Lusaka: Govt. Printer. [fcp] [2s. 6d.]

The veterinary staff was the same as in 1933. Financial stringency made itself felt and greatly hindered the work. A severe plague of locusts spoilt large areas of pasture, on which cattle refused to graze.

ANIMAL DISEASES.—Trypanosomiasis occurs in about five-eighths of the colony, in tsetse fly infested districts, but outbreaks have occurred some distance from the tsetse areas, and it is suggested that the disease may be transmitted by other flies. Daily doses of from 3 to 4 oz. of bone meal are said to be valuable in the treatment of infected cattle. Potassium antimony tartrate was used in the routine treatment.

The prospects of finally eradicating contagious bovine pleuro-pneumonia from Barotseland were very favourable in 1934 and lack of funds alone held up the work.

To control foot and mouth disease 70,000 head of cattle were inoculated (intramucosal tongue infection) in order that all the susceptible animals should go through the disease rapidly. There was no mortality.

Rabies increased slightly during the year. The control scheme described in the previous year's report was not put into operation.—J. E.

NORTHERN RHODESIA. (1935). **Report of the Assistant Veterinary Research Officer.** [LE ROUX, P. L.]—*Rep. Dep. Anim. Hlth N. Rhod.,1934.* pp. 23-39. 1 table.

The routine work is detailed, but no research was possible as the assistant research officer was on tour, working on foot and mouth disease, for over seven months. His observations on various diseases are given ; they serve as supplements to the survey of diseases published in the report for 1933.

Mr. le Roux describes 14 types of lesion in foot and mouth disease, some of which are peculiar to the locality and are a cause of confusion in diagnosis.

The disease spread and was more severe during the dry season, and the cropping of dry vegetation favoured the formation of lip and tongue lesions owing to the mechanical irritation caused thereby. No difference from the usual behaviour was observed in the course of artificial infection tests. The method of routine artificial infections for control purposes is described.—J. E.

NYASALAND PROTECTORATE. (1934). **Report of the Veterinary Department for the Year ended 31st December, 1933.** [TURNBULL, D. O.] pp. 8. Zomba : Govt. Printer. [fcp].

The staff consisted of four British veterinary officers, two British stock inspectors, and some 200 natives.

ANIMAL DISEASES.—A few outbreaks of trypanosomiasis in cattle occurred, but the loss was not great. East Coast fever is enzootic and is only kept down by regular dipping. The natives are becoming more alive to the value of dipping and now co-operate fairly well : 92 tanks were in use during the year. Piroplasmosis, anaplasmosis and *Theileria mutans* infection are enzootic, but indigenous stock have a high degree of resistance to these diseases, calves being the chief victims. Swine fever caused heavy losses in the Fort Manning district and appears to have become established there. Rabies in dogs was definitely diagnosed 12 times. Four outbreaks of demodectic mange in cattle occurred.

Notes on other common diseases are also given.—J. E.

TRINIDAD AND TOBAGO. (1935). **Report of the Veterinary Division – 1934.** [METIVIER, H. V. M.]—*Rep. Dir. Agric. Trinidad & Tobago, 1934.* pp. 29-31. Trinidad : Govt. Printer.

The veterinary staff numbered three ; of these one, normally stationed in Tobago, worked in Trinidad vaccinating cattle against paralytic rabies.

ANIMAL DISEASES.—No case of anthrax, glanders, epizootic lymphangitis, foot and mouth disease, swine fever or rabies in dogs was observed. Five cattle were found, on slaughter, to be tuberculous and ten of the same origin reacted to tuberculin.

Paralytic rabies is the most important stock disease, 312 cases having been observed. It is controlled by vaccination and bat "bites" can be lessened by placing poisoned "bait" animals that have been bitten, strychnine being smeared on the bite, to poison the bat on a return visit.

Professor URICH of the Imperial College of Tropical Agriculture was put in

charge of research on the habits of bats which transmit paralytic rabies [see this *Bull.* **6.** 573].

Bovine contagious abortion was observed in a few herds. Farmers are advised to isolate affected cows and so to eradicate the infection.

Ophthalmia, chiefly affecting calves, was very prevalent on the government farm : the cause is unknown, though formerly it was considered that lice attached to the eyelashes were the primary cause.

Some 18,000 head of livestock were imported during the year.—J. E.

HONG KONG. (1936). **Report by the Colonial Veterinary Surgeon, Hong Kong, for 1935.** [MACKENZIE, W. J. E.] pp. 4. 1 table.

The work of the Colonial Veterinary Surgeon and his staff is largely devoted to meat inspection and the report relates mostly to this work. The quarantine of imported animals is also supervised.

Eleven cases of rabies [? all in dogs] were diagnosed during the year, and two outbreaks of rinderpest occurred. There were 554 horses, 2,974 head of cattle, 277 goats and an unknown number of swine in the colony.—J. E.

FRANCE. (1936). Rapport sur les opérations du service vétérinaire sanitaire de Paris et du département de la Seine pendant l'année 1935. [**Report of the Veterinary Services of Paris and the Seine Department, France, 1935**]. [CHRÉTIEN, A.] pp. 151. 56 tables, 2 graphs. Paris : Imprimerie Chaix. [8vo].

The report of the Director of Veterinary Services of Paris and the Seine Department for 1935 is, as usual, full of information. The staff consists of a director, 45 veterinarians and 105 assistants.

RABIES.—Four cases occurred.

FOOT AND MOUTH DISEASE.—256 cases were discovered in cow-sheds, none in public markets, but 274 cases in the abattoirs of La Villette, Vaugirard and Levallois.

SWINE FEVER.—Four outbreaks occurred during the year.

GLANDERS, ANTHRAX AND MANGE.—No cases were reported.

Full statistics are given of the number of animals passed through the different markets, and of the number of carcasses imported.

THE COOLING OF OFFAL.—Where chilling chambers are not available, great success was obtained by immersing offal in iced water immediately after evisceration.

ODORIFFROUS FOODS.—Large quantities of poultry were found unsuitable for food owing to a peculiar odour in the flesh. Investigations proved that these odours are due to the food supplied to the fowls, *e.g.* fish meal, rancid vegetables, etc.—T. DUNLOP YOUNG.

HOLLAND. (1935). Verslag van de werkzaamheden der Rijksseruminrichting over 1934. [**Report of the State Serum Institute, Rotterdam, Holland, for 1934**]. [LOURENS, L. F. D. E.] pp. 100. 7 figs. on 3 plates, 14 tables. The Hague : Algemeene Landsdrukkerij. [8vo] [Fl. 1].

During 1934, 5,527 kg. of serum and vaccine were sent out, a quantity sufficient for 2,100,000 animals. The total number of general diagnostic examinations was 31,174.

The following special research work was carried out :–

AUJESZKY'S DISEASE.—In January a few cases in cattle were examined. The first very slight symptoms were observed in pigs bought a few days previously. The virus was shown to be abundantly present in the blood of pigs from the

third to the fifth days, mostly in union with the red blood corpuscles, and entering freely into the serum after their breakdown.

Experiments with Dyes for the Denaturation of Animal Food.—Rhodamine B, given mixed with the food, was found to cause changes in the colour of the flesh of pigs and fowls and of eggs, and to give rise to myositis in pigs. It was therefore replaced by the harmless acid fuchsin.

Tuberculin Reactions, Koch's Tuberculin and Synthetic Tuberculin.—The ophthalmic reaction has in general given good results. Errors and non-specific reactions having, however, been obtained, experiments were made with a bovine tuberculin, for intradermal application, prepared on Dorset's synthetic medium. Parallel experiments were made with old tuberculin. After 24 hours old tuberculin gave more non-specific reactions than the synthetic tuberculin. After 48 hours there was only a slight difference. A very strong non-specific reaction to synthetic tuberculin was noticed in one animal at the first injection and each time upon repetition. In experiments made with intradermal tuberculin just after railway or other transport several incorrect results in both positive and negative directions have been obtained.

Neurolymphomatosis of Fowls (Fowl Paralysis).—Research failed to show the presence of a virus and no connexion was found with coccidiosis. The blood picture is not characteristic.

Infectious Coryza of Chickens.—A haemophilic bacillus was isolated from cases of fowl coryza, but it was not possible to infect test fowls by broth culture placed in the upper respiratory passages. Unfiltered nasal exudate did transmit the disease.

Infectious Laryngotracheitis.—This disease has not been reported in Holland up to the present time.

Ambulatory Section.—Some descriptions of the diseases investigated are given, of which the following are of most importance. Deaths in lambs grazing in an orchard sprayed with copper sulphate were attributed to copper poisoning, copper being found in abnormal quantities in the stomach contents and liver. Prominent symptoms were swellings in the throat and mummification of the skin [photosensitization ?]. Lead poisoning occurred in cows from drinking water passing through a lead pipe which had been in use for 37 years. No lead could be discovered in the liver, but it was encountered in the brain.

H. E. Reeser deals with the prolan pregnancy diagnosis reaction, which is not entirely reliable in tests with animals.

An account is given of work on bee diseases.—M. J. J. Houthuis (Rotterdam).

Dutch East Indies. (1935). Verslag van het Veeartsenijkundig Instituut over het jaar 1934. [**Report of the Veterinary Institute, Buitenzorg, Java, for 1934**]. [Bubberman, C.]—*Jversl. veeartsenijk. Inst., Buitenz., 1934.* pp. 91-126. 10 tables.

In spite of heavy " cuts " in the public funds assigned to the institute, and in the veterinary staff, the research and diagnostic work has been carried on, and also the production on a large scale of antisera and vaccines. The silver jubilee of the institute was celebrated in 1933. One of the five sections – that for studying poultry diseases – had to be closed down owing to lack of funds.

It was found that a sodium arsenite dip could be used to replace a commercial preparation that was expensive and which had hitherto been used.

Dermatitis in cattle in Northern Celebes and South Sumatra, locally known as " cascado ", has been found to be due to infection with *Stephanofilaria dedoesi.* In Northern Celebes it has been found also in the goat.

The viability of the virus of peristomatitis contagiosa in sheep and goats was tested against exposure to heat and sunlight.

The anaerobic bacillus isolated from cases of osteomyelitis bacillosa bubalorum in water buffaloes is being studied. *Clostridium welchii* appears to be frequently found in the intestines of sheep and goats in Java.

The section dealing with tuberculosis, glanders and sero-diagnosis reported upon 3,814 sero-reactions for the diagnosis of glanders, bovine contagious abortion and anthrax. The study of lepra bubalorum was continued.

Work is in hand on a glanders vaccine prepared from cultures on bile media.

The section for the preparation of antisera and vaccines produced a total of 1,845,900 c.c. of antiserum and 1,582,909 c.c. of vaccine. Haemorrhagic septicaemia serum was used for the treatment of 384 buffaloes, 70 per cent. of the animals having survived. This septicaemia formol vaccine was issued in large quantities and was shown to confer immunity for six or eight months. In addition to the ordinary anthrax vaccine for buffaloes, cattle and sheep, a special vaccine of lower virulence was brought into use for the more susceptible species – horses, goats and swine. 151,000 doses of both vaccines were administered with good results, and 55 per cent. of 143 animals recovered after curative serum treatment. In Celebes some cases of post-vaccinal oedema were seen in horses. Experiments with a glucoside vaccine were stopped because of serious local reactions. 69,000 animals were successfully vaccinated with bacteria-free blackleg filtrate. Experiments with a formol whole-culture vaccine showed it to be equally valuable, whilst there are indications that the resultant immunity develops earlier.

The zoological section studied several parasites new to the Dutch East Indies. A biochemical investigation was started of the metabolism of *Trypanosoma evansi* in affected animals.—M. J. J. Houthuis (Rotterdam).

Japan. (1936). Statistique annuelle des maladies infectieuses des animaux en 1934. [**Japan. Annual Statistics of Infectious Diseases of Animals, 1934**]. —*Bull. Off. internat. Epiz.* **11.** 644-646. 2 tables. [1 ref.]

Anthrax was observed in 45 prefectures, causing death in 153 cattle, 32 horses and 4 pigs. Blackleg was observed in 32 prefectures and caused the death of 84 animals. Swine erysipelas was wide-spread, but the majority of affected pigs recovered. Haemorrhagic septicaemia in swine occurred in 19 prefectures and about 1,000 pigs died. Fowl cholera was not observed.

Bovine contagious abortion was most prevalent in the neighbourhood of Tokio and of Hiogo, and swine fever in the neighbourhood of Tokio and of Aichi.

Glanders, epizootic lymphangitis, rinderpest, foot and mouth disease, contagious bovine pleuro-pneumonia, sheep pox, horse pox and sheep and goat scab were not observed.

Preventive vaccination was employed extensively against anthrax, blackleg, haemorrhagic septicaemia, swine erysipelas and, to a small extent, against swine fever.

Tuberculosis was diagnosed in 1,593 out of 150,294 cattle examined, either clinically or by the tuberculin test.—J. E.

BOOK REVIEWS.

—. (1936). **Catalogue of British Medical Films.**—pp. 48. London : Brit. Film Inst. [8vo] [1s.]

The Medical Panel of the British Film Institute has in this publication compiled a list of educational films produced and owned by numerous medical schools throughout Great Britain. While the number of films on human medical subjects is large, only two films of veterinary subjects are here included : they show two operations on horses, both produced by Kodak Ltd. [About a dozen additional films on veterinary subjects have been prepared and it is understood that they will be included in a supplement to the catalogue that will be published].—J. E.

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